# Chester Society

OF

# Natural Science, Literature & Art.

(FOUNDED BY CHARLES KINGSLEY, 1871.)

## TWENTY-EIGHTH

# ANNUAL REPORT

AND

# PROCEEDINGS,

FOR THE YEAR 1898-99.

*FOR CONTENTS—SEE TITLE PAGE.*

CHESTER:

PRINTED BY G. R. GRIFFITH, "THE CASTLE" PRINTING WORKS.

MDCCCXCIX.

# CHESTER SOCIETY

OF

# NATURAL SCIENCE, LITERATURE & ART.

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# ANNUAL REPORT

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# PROCEEDINGS.

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# THE LIBRARY

IS OPEN TO THE MEMBERS DAILY FROM 10 A.M. TO 5 P.M.; AND ON THURSDAYS DURING WINTER FROM 10 A.M. TO 8 P.M.

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***** The New Edition of the Catalogue of Books in the Society's Library, is now published, and may be obtained at 4, Eastgate Row; or from the Museum; price 3d. each.**

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## Additions to the Society's Library 1898-99.

### DONATIONS.

Crustacea, Pamphlets on, A. O. Walker. *By the Author.*
Field, The, for the year 1899 to date. *By Mr. H. B. Dutton.*
Ditto ditto *By Dr. Elliott.*
Flora of Cheshire, The, the late Lord de Tabley. *By Mr. J. D. Siddall.*
Gypsum Boulder of Great Crosby, The, its History and meaning (Pamphlet): T. Mellard Reade. *By the Author.*
Insects, Report of Injurious (Common Farm Pests), A. E. Ormerod, 7 vols. *By Mr. R. Newstead, Curator.*
Meteorology, Handy Book of, Alex. Buchan. *By Miss Eggers.*
Reprint from Zoologist on Whiskered Bat. *By Mr. Charles Oldham.*
Photo-Micrography, Edmund J. Spitta. *By Dr. Stolterfoth.*
Remarques sur la Tératologie Végétale par C. de Candolle. *By the Author.*

### BY EXCHANGE.

Agriculture, Year Book of the Department of, U. S. A.
American Fauna, North
Bristol Naturalists' Society, Proceedings of the
British Association for the Advancement of Science, Report of the
Cardiff Naturalists' Society, Report of the
United States Geological Survey, Report of the
Geologists' Association, Proceedings of the
Manchester Field Naturalist and Archæological Society, Report and Proceedings of the
Manchester Geological Society, Transactions of the
Millport Marine Biological Station, Report of the
Northamptonshire Natural History Society, Journal of the
Smithsonian Report
Zoology, Proceedings of the Fourth International Congress of

### BY PURCHASE.

Entomologist, The
Entomological Society, London, Transactions of the
Naturalists' Journal
Zoologist, The

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☞ **Copies of Nos. II. and III. of the Society's Proceedings (price 2/6 each), and No. IV. (5/-), may be obtained at the Museum.**

**Additional copies of this Report (price One Shilling) may be obtained from the Hon. Treasurer, Mr. J. SIMON; or from the Museum.**

# Officers and Committee for 1899-1900.

## President:

J. D. SIDDALL, Esq.

## Vice-Presidents:

HIS GRACE THE DUKE OF WESTMINSTER, K.G.

Prof. T. McKENNY HUGHES, F.R.S.
A. O. WALKER, Esq., J.P., F.L.S.
W. M. DOBIE, Esq., M.D., J.P., F.R.A.S.
H. STOLTERFOTH, Esq., M.A., M.D., J.P.
T. SHEPHEARD, Esq., F.R.M.S.
G. R. GRIFFITH, Esq.

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Chairman—Mr. J. D. SIDDALL ... ... ... ... ... 19, *Eaton Road.*
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### ZOOLOGICAL.

Chairman—Dr. W. HENRY DOBIE ... ... ... ... 2, *Hunter Street.*
Secretary—Mr. W. F. J. SHEPHEARD, F.C.S. ... ... *Bridge Street Row.*

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Secretary—Mr. J. BAIRSTOW, F.C.S. ... ... ... *Burley, Queen's Park.*

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Chairman—Dr. STOLTERFOTH ... ... ... ... ... 1, *Grey Friars.*
Secretary—Mr. J. D. SIDDALL... ... ... ... ... 19, *Eaton Road.*

### PHOTOGRAPHIC.

Chairman—Dr. STOLTERFOTH ... ... ... ... ... 1, *Grey Friars.*
Secretary—Mr. J. H. SPENCER ... ... ... ... 36, *Bridge Street.*

### LITERATURE.

Chairman—Rev. A. H. FISH, B.A., B.Sc. ... ... ... *Arnold House.*
Secretary—Mr. H. G. PHILLIPSON, B.A.... ... ... 23, *Liverpool Road.*

### ASTRONOMICAL.

Chairman—Dr. W. M. DOBIE ... ... ... ... ... *Northgate House.*
Secretary—Mr. F. W. LONGBOTTOM ... ... ... *Haslemere, Queen's Park.*

### ART.

Chairman—The Very Rev. Dr. DARBY ... ... ... *The Deanery.*
Secretary—Mr. WALTER SCHRÖDER ... ... ... 30, *Eaton Road.*

## Hon. Treasurer:

Mr. JOHN SIMON, 4, *Eastgate Row.*

## Hon. Secretaries:

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*General*—Mr. G. P. MILN, *Milnholme, Brook Lane.*
Mr. W. F. J. SHEPHEARD, F.C.S., *Bridge Street Row.*

## Hon. Librarian:

Mr. P. H. FLETCHER, *Woodbrae, Curzon Park.*

## Committee:

The above Officers *(Ex-Officio)*,
AND

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Rev. J. L. BEDFORD, M.A., F.L.S.
Mr. J. DAY.
Mr. J. LYON DENSON.
Dr. HERBERT DOBIE.
Dr. HAMILTON.
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Dr. KING.
Mr. W. F. LOWE, A.R.S.M., F.I.C., F.C.S.
Mr. J. A. McMICHAEL, B.A., B.Sc.
Mr. W. SHONE, F.G.S.

## Hon. Auditors:

Mr. BERESFORD ADAMS. Mr. C. R. ENOCK, F.C.A.

## Curator and Assistant-Librarian:

Mr. R. NEWSTEAD, F.E.S., *The Grosvenor Museum.*

## Assistant-Secretary:

Mr. H NEW.

## Representatives of the Society upon the Grosvenor Museum Management Committee.

Rev. A. H. FISH, B.A., B.Sc.
Mr. J. D. SIDDALL.
Mr. G. P. MILN.
Mr. J. H. SPENCER.
Mr. W. F. J. SHEPHEARD, F.C.S.
Mr. G. WATMOUGH WEBSTER, F.C.S.

# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art*," and that its objects be the promotion of the study of Natural Science and Literature by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Eight Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any Candidate for Membership of the Society, with those of a Proposer and a Seconder, must be sent in writing to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

7.—That each Member shall be allowed to introduce one *non*-resident friend at any of the General Meetings, except at the Annual General Meeting; but a Member may introduce a friend, whether resident in Chester or not, at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings.

8.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription and all arrears.

9.—The names of Members whose Subscriptions are two years in arrear, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members.

10.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

11.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

12.—That the Committee shall arrange General Field Meetings during the year. The place of meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

13.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

14.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies the election shall be by Ballot. The Officers' Reports and Financial Statement, made up to the end of April, and duly audited, shall also be submitted, and read if desired.

15.—Nominations for the Committee and Auditors shall be sent in writing to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

16.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

17.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

18.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# THE PRESIDENT'S ADDRESS

*At the Annual Meeting.*

In consequence of his many official duties as Mayor, Dr. Stolterfoth is not able this year to contribute the admirable resumè of the scientific work and progress of the Society which has been the chief feature of the Report during many years past. In its place the General Secretaries present an epitome, and, in addition, abstracts of Lectures, and Notes and Communications to the Society by the Members. It is hoped to extend these, if possible, year by year, and so include the Proceedings in the Annual Report. Of course, this can only be done by rigorous condensation, otherwise the extent of the Report would render its expense prohibitive. The amount of interest and pleasure the Society already gives for the very small annual subscription of 5/-, is vastly beyond what we are reasonably entitled to expect. It would be quite impossible to furnish so many admirably prepared and attractive Lectures, or to maintain such a model Museum and Lecture Theatre, &c., were it not for the fact that so much of the work of the Society is done gratuitously. Our sincere gratitude is due, indeed, to the able and kindly helpers who thus keep alive the love of natural history and cognate subjects among us. But even with all this gratuitous service, it requires an almost penurious care of the funds available from subscriptions in order to meet our absolutely necessary expenses. As joint holders of the Grosvenor Museum, we are responsible in our proportionate degree for the expense of maintaining it. Our quota of £60 per annum is very small for the privileges we enjoy, and we may at any time find ourselves called upon for an increased payment; but that demand will, of course, never be made except as a last resource. I purposely place these facts before you to show you how necessary it is we should have a largely increased membership list. It has grown, and is still doing so, but if every Member would realize the importance of augmenting our income by extended Membership we ought to be able every year to do something independently towards the perfect equipment of this grand building, with its priceless and admirably displayed collection of natural and historic treasures. The year just passed, during which I have had the great honour to be your President, has witnessed the steady continuation of the successful operation of the Society. We have had many capital Lectures and good audiences, and thanks to steadfast friends, such as the Rev. A. H. Fish, Drs. Dobie, Mr. Newstead, the Mayor, and others, we have had the latest scientific discoveries demonstrated and elucidated for us. We have also had remarkably successful Lectures from Major Wilford LLoyd, Mr. Lamond Howie, and Mr. Feilding. In addition to the ordinary Lectures, the Photographic Section has held many special "Workers'" Meetings. This is an example worthy of being followed by other Sections, and may be commended to the Secretaries. There have also been held two "Museum Evenings," when invitations were issued to assistants in the various large places of business in the City to come to be shown through the Museum; short illustrated Lectures and a little music, and finally tea and coffee were also provided. About 150 were present on each evening, and both were most successful in making known the Museum and its contents to many who had never before been in the building. Another new feature in the Society's working was the extension of the Annual Excursion over

several days; delightful weather on the grand North Coast of Anglesey, and very comfortable quarters made this a memorable event which those who participated in it enjoyed greatly. The recent issue of Lord de Tabley's "Flora of Cheshire," although so long delayed in publication, is a most valuable contribution to the natural history of our district. There is a copy in the Society's Library, and I very strongly recommend all who are interested in our local Flora to study it carefully.

At the request of some of our Members who are interested in Art matters, a new Section has been added, which, with the Very Rev. the Dean and Mr. Schröder as its Chairman and Secretary, will doubtless add considerably to the Society's usefulness.

Mr. A. O. Walker having gone to reside in Kent, has resigned the chairmanship of the Zoological Section, and Dr. W. Henry Dobie has been elected in his place. Mr. Walker's removal is in every way a great loss to us. It is hardly to be expected we shall have him often among us in future, and we can ill spare so thoroughly good a friend and scientific worker.

I appeal with confidence to Members to bear in mind what I have said as to supporting the Society. It needs no words of mine to bear witness to the altogether beneficial nature of the work wisely conceived and enthusiastically started by its great founder, Charles Kingsley. Its career during thirty years has been socially and morally a benefit to all classes of society in Chester, and it is both an honour and a duty to us to be actively connected with it.

J. D. SIDDALL.

## HON. SECRETARIES' REPORT.

YOUR Committee have met twelve times during the past year for the carrying on of the general business of the Society. The attendance at these Meetings has been above the average, and the Members generally have shewn a keen interest in all that concerns the welfare of the Society; and they have also proved to be very helpful to the various officers.

The total membership of the Society, up to the present time, is 808, and is made up as follows:—

| | |
|---|---|
| Honorary Members - - - | 29 |
| Corresponding Members - - - | 18 |
| Ordinary Members - - - - | 761 |
| Total - - | 808 |

The number at the present time is thus higher than at any other period in the history of the Society. The membership has, during the past few years, made steady progress, a fact which we think is in favour of having local Presidents, who can always be with us to stimulate Members in carrying on the work of the Society.

There were seven Excursions held during the Session, as follows:—

| | |
|---|---|
| Eaton Hall and Gardens | May 24th. |
| Bull Bay | June 10th to 14th. |
| Cuckoo Hill, Hope | June 22nd. |
| Delamere Forest and Meres | June 29th. |
| Stonyhurst College | July 14th. |
| Meliden | July 22nd. |
| Serpentine, Eaton | July 27th. |

The Conversazione also proved to be a very popular and a very pleasant gathering of Members and their friends. Although there was no special outside attraction provided—the exhibits being worked entirely by our own Members—the attendance was quite up to the average.

With regard to the Winter Session, we think we may fairly claim that this has been one of the most successful we have ever had. There were altogether nine General Meetings, and also sixteen Sectional Meetings, as follows:—

## GENERAL MEETINGS.

1898.—

Oct. 6th—Annual Conversazione.

„ 27th—"New Spider Studies"—Rev. Dr. Dallinger, F.R.S.

Nov. 24th—"Snakes and Serpents"—Dr. Mules.

1899.

Jan. 5th—"Five European Capitals; or Berlin to Buda-Pesth"—
W. Lamond Howie, Esq., F.C.S.

Feb. 3rd—"The Egyptian Campaigns from 1882 to 1898"—
Major Wilford N. Lloyd.

„ 16th—"The North Coast of Anglesea"—
The President (J. D. Siddall, Esq.)

March 9th—"Two Years' Service in the Malay Peninsula under His Highness Abu Bakar, the late Sultan of Johore"—
John Basil Feilding, Esq.

April 6th—Exhibition of a new Electrolytic Break for Induction Coils and the production of X-Rays—Rev. A. H. Fish, B.A., B.Sc.

„ 20th—Exhibition of Spring Flowers—
Members of the Chester Paxton Society & others.

## SECTIONAL MEETINGS.

### BOTANICAL.

1899.

Jan. 12th—Exhibition of Lantern Slides by The Chairman; and a Paper entitled "Some Modifications of Leaf Structure" by the Secretary.

Mar. 23rd—"The Distribution of the Flora of North Wales," by
Mr. J. Lloyd Williams.

## ZOOLOGICAL.

1898.
Oct. 20th—"Faunistic Distribution: its Problems and Perplexities," by
MR. W. E. SHARP.

1899.
Jan. 19th—"Review of the past year," by MR. A. O. WALKER, F.L.S.
"Moth Visitors at the Electric Lamps," by DR. HERBERT DOBIE.
"The Bird Colonies of the Skerries";
"The Middle Mouse and its occupants";
"Bull Bay: its characteristic Birds and Insects."
Notes on the above by MR. R. NEWSTEAD, F.E.S.

## GEOLOGICAL.

1898.
Nov. 3rd—"Sea Beaches: their formation and cause of encroachment upon receding shores," by MR. W. SHONE, F.G.S.

1899.
Jan. 26th—"The Microscopic Structure of Coal Plants," by
MR. W. W. MIDGLEY, F R.M.S.

## NATURAL PHILOSOPHY.

1898.
Nov. 10th—"Combustion—Flame, luminous and non-luminous—Comparison of luminosity," by MR. CHAS. T. F. WATTS, B.Sc., F.C.S.

1899.
Feb. 9th—"Some Methods of Telegraphy," by MR. T. HETHERINGTON.

## MICROSCOPICAL.

1898.
Nov. 17th—"An Exhibition of Microscopical Preparations of Spiders to further elucidate their Structure and Natural History, and as a Supplement to Dr. Dallinger's Lecture," by
THE CHAIRMAN, assisted by MR. NEWSTEAD & others.

## PHOTOGRAPHIC.

1898.
Dec. 1st—"Demonstration of Platinotype Printing," by
MR. G. WATMOUGH WEBSTER, F.C.S.

1899,
Feb. 23rd—"An Alpine Holiday," by REV. F. JAMES, M.A.
Apr. 13th—Exhibition of Lantern Slides, by MEMBERS OF THE SECTION.

## LITERATURE.

1898.
Dec. 8th—"Lewis Carroll," by MR. H. G. PHILLIPSON, B.A.

1899.
Mar. 2nd—"The Characters of Theophrastus," by
REV. CLEMENT BIRD, M.A.

## ASTRONOMICAL.

1898.
Dec. 15th—"The Spangled Heavens," by DR. H. WHICHELLO.

1899.
Mar. 16th——"From Greenwich to Yerkes," by
MR. R. C. JOHNSON, F.R.A.S.

G. P. MILN, } *Hon. Gen.*
W. F. J. SHEPHEARD, } *Secretaries.*

MAY 11TH, 1899.

# The Hon. Treasurer in account with the Chester Society of Natural Science and Literature, for the Year ending April 30th, 1899.

| Dr. | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| 1898-9. | | | | | | |
| By Subscriptions— | | | | | | |
| 681 for 1898-9 @ 5/- .. .. | 170 | 5 | 0 | | | |
| 17 ,, 1897-8 @ 5/- .. .. | 4 | 5 | 0 | | | |
| 2 ,, 1896-7 @ 5/- .. .. | 0 | 10 | 0 | | | |
| 1 ,, 1895-6 @ 5/- .. .. | 0 | 5 | 0 | | | |
| | | | | 175 | 5 | 0 |
| ,, Gross Receipts from Excursions .. .. .. | | | | 40 | 11 | 9 |
| ,, Gross Receipts from Lectures, Evening Meetings, &c. .. .. .. .. .. .. | | | | 62 | 8 | 0½ |
| ,, Donation from Mr. Shone to purchase Stone Foot-prints .. .. .. .. .. | | | | 2 | 2 | 0 |
| | | | | £280 | 6 | 9½ |

| Cr. | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| 1898-9. | | | | | | |
| To Balance from last Year .. .. | | | | 1 | 9 | 11 |
| ,, Museum Management Committee— | | | | | | |
| Proportion of cost of Maintenance | 60 | 0 | 0 | | | |
| Lantern Account .. .. .. | 9 | 19 | 6 | | | |
| | | | | 69 | 19 | 6 |
| ,, Natural History Museum and Library .. .. | | | | 27 | 8 | 5 |
| ,, Printing, Advertising, Stationery, &c. .. .. | | | | 39 | 7 | 5½ |
| ,, Expenses in connection with Excursions .. .. | | | | 36 | 5 | 3 |
| ,, Postages .. .. .. .. .. .. | | | | 21 | 16 | 6 |
| ,, Expenses in connection with Lectures .. .. | | | | 51 | 1 | 1 |
| ,, Donations, &c. .. .. .. .. .. | | | | 10 | 4 | 0 |
| ,, Salaries— | | | | | | |
| Assistant Secretary .. .. | 10 | 16 | 8 | | | |
| Mr. Alfred Newstead .. .. | 8 | 6 | 8 | | | |
| | | | | 19 | 3 | 4 |
| ,, Subscriptions— | | | | | | |
| Palæontographical Society .. | 1 | 1 | 0 | | | |
| Entomological Society .. .. | 1 | 1 | 0 | | | |
| | | | | 2 | 2 | 0 |
| ,, Cheque Book .. .. .. .. .. | | | | 0 | 5 | 0 |
| Balance in hand .. .. .. | | | | 1 | 4 | 4 |
| | | | | £280 | 6 | 9½ |

9TH MAY, 1899—*Examined and found correct,*

C. R. ENOCK, F.C.A.,
BERESFORD ADAMS, } HON. AUDITORS.

JOHN SIMON, HON. TREASURER.

# "KINGSLEY MEMORIAL" FUND.

## STATEMENT OF ACCOUNT for the Year ended 30th April, 1899.

**Dr.** **Cr.**

| 1898-9. | £ | s. | d. |
|---|---|---|---|
| To Balance from last Account .. .. .. .. | 9 | 6 | 4 |
| ,, Dividends on Great Western Railway Company Consolidated Ordinary Stock .. .. .. | 11 | 4 | 9 |
| | £20 | 11 | 1 |
| To Balance in Bank .. .. .. .. | 3 | 16 | 1 |

| 1898-9. | £ | s. | d. |
|---|---|---|---|
| By Grant for Natural Science Society's Natural History Museum .. .. .. .. .. .. | 15 | 0 | 0 |
| ,, Prize awarded to Miss Newstead .. .. .. | 1 | 1 | 0 |
| ,, ,, ,, Master King .. .. .. | 0 | 10 | 6 |
| ,, Interest and Commission charged by Bank .. | 0 | 3 | 6 |
| Balance .. .. .. .. .. .. | 3 | 16 | 1 |
| | £20 | 11 | 1 |

5TH MAY, 1899—Examined and found correct,

JOHN DAVIES,
HON. AUDITOR.

G. P. MILN,
HON. TREASURER.

# CURATOR'S REPORT.

THE additions to the Natural History Museum are as follows:—

| ABSTRACT OF THE REPORT. | Species Presented and Purchased. | Total of Species. | Total of Specimens. |
|---|---|---|---|
| Geology .. .. .. .. .. .. | 3 | 3 | 66 |
| *Botany (Plants, &c.) .. .. .. .. | 1 | 1 | 1 |
| *Crustacea* (Shrimps, &c.) .. .. .. | 1 | 1 | 5 |
| *Diptera* (Two-winged Flies) .. .. .. | 1 | 1 | 1 |
| *Lepidoptera* (Moths and Butterflies) .. .. | 131 | 131 | 195 |
| *Coleoptera* (Beetles) .. .. .. .. | 13 | 13 | 39 |
| *Neuroptera* (Dragon-flies, &c ) .. .. .. | 2 | 2 | 2 |
| *Hymenoptera* (Bees and Wasps) .. .. | 13 | 13 | 31 |
| *Mollusca* (Shells, &c.) .. .. .. .. | 16 | 16 | 102 |
| *Arachnida* (Spiders, &c.) .. .. .. | 3 | 3 | 6 |
| *Pisces* (Fish, &c.) .. .. .. .. .. | 1 | 1 | 1 |
| *Reptilia* (Snakes, &c.) .. .. .. .. | 1 | 1 | 4 |
| Nests and Eggs .. .. .. .. .. | 46 | 46 | 257 |
| *Aves* (Birds) .. .. .. .. .. | 15 | 15 | 34 |
| *Mammalia* (Animals) .. .. .. .. | 12 | 12 | 14 |
| Miscellaneous .. .. .. .. .. | — | — | 1 |
| Total .. .. .. .. | 259 | 259 | 759 |

* Does not include collections sent in for special prizes.

It will be seen on reference to previous years there has been a considerable falling off in the total number of additions to our Museum; but your Curator is glad to say this does not in any way indicate a lack of interest in those who have, all along, so materially helped us by their sympathy and valuable contributions; we are fortunate to-day in having a larger number of Field Naturalists than in any previous year, and it is from such contributors we have been able to make many rare additions to our collections.

MR. WM. SHONE'S liberal donation enabled us to secure a large and valuable collection of the Fossil Foot-prints of *Cheirotherium Storetonense*, which makes our collection the finest of its kind in Great Britain. One of two Slabs of Foot-prints is the largest that has yet been successfully removed from the quarries.

In the *Lepidoptera*, MR. ARKLE has spared no pains in adding to our collections and renewing our series. In this field we have two comparatively new workers, DR. HERBERT DOBIE and MR. COLLINS, of Warrington. We remember, with pleasure, the wonderful collection of Moths made by DR. HERBERT DOBIE at the electric lamps; the whole of this collection was generously placed at your Curator's disposal, which enabled him to add several new species to the Society's Collection, including the first authentic specimen of *Sphinx ligustri*. MR. COLLINS has also added two species new to the collection. Our Corresponding Member, MR. CHAS. OLDHAM, has helped us in many departments, as will be seen on referring to the detailed list of contributions. And we must again express our gratitude to MR. A. O. WALKER, DR. W. H. DOBIE, and MR. R. J. SMITH, for their continued support.

# LIST OF DONORS AND ADDITIONS TO THE MUSEUM.

| | Geology. | | Botany (Plants, &c.) | | *Crustacea* (Shrimps, &c.) | | *Diptera* (Two-winged Flies.) | | *Lepidoptera* (Moths & Butterflies.) | | *Coleoptera* (Beetles.) | | *Neuroptera* (Dragon-flies, &c.) | | *Hymenoptera* (Bees and Wasps.) | | *Mollusca* (Shells, &c.) | | *Arachnida* (Spiders, &c.) | | *Pisces* (Fish, &c.) | | *Reptilia* (Snakes, &c.) | | Nests and Eggs. | | *Aves* (Birds.) | | *Mammalia* (Animals.) | | Miscellaneous. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. |
| Mr. J. Arkle ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. Sefton Bowers ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Col. B. G. Davies-Cooke | 1 | 1 | ... | ... | ... | ... | 6 | 14 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. Jos. Collins ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 40 | 150 | ... | ... | ... | ... | ... | ... |
| Mr. T. H. Court ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | 1 | 1 | ... | ... | ... | ... |
| Rev. Thos. Cox ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. George Crewe ... | ... | ... | ... | ... | ... | ... | ... | ... | 41 | 56 | 1 | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. Hart Davies ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. L. Denson ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Dr. Herbert Dobie ... | ... | ... | 1 | 1 | ... | ... | ... | ... | 1 | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. R. Dutton ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. George Dutton ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. H. B. Dutton ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| Mr. T. J. Evans ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. W. E. Fairlie ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... |
| Mr. Faulkner ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Miss Margaret T. Griffith | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. Guy ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... |
| Mr. T. H. Hignett ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Miss Humberston ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 18 | ... | ... | ... | ... | ... | ... |
| Mrs. Dr. Kenyon ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. Knight ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | 3 | 20 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... |
| Mr. G. P. Miln ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. A. Monk ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. S. Mossford ... | ... | 1 | 5 | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | 6 | 12 | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 83 | 2 | 21 | ... | ... | ... | ... |
| Mr. R. Newstead (Curator) | ... | 1 | 3 | ... | ... | ... | 40 | 58 | ... | ... | 6 | 12 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | 12 | 14 | ... | ... | ... | ... |
| Mr. Chas. Oldham ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | 7 | 49 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... |
| Mr. A. C. Parker ... | ... | ... | ... | ... | ... | ... | 27 | 29 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Miss Payne ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 | 53 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... |
| Mr. J. M. Porter ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Rev. F. A. Potts ... | ... | ... | 50 | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mrs. Price ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. W. F. J. Shepheard | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. William Shone ... | ... | ... | 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 5 | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. D. Siddall ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 4 | 5 | 5 | ... | ... | ... | ... |
| Master F. A. Siddall ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. R. H. Thompson ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. A. O. Walker ... | ... | ... | ... | ... | 1 | 5 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1898.

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

The results here given are deduced from bi-daily observations of the standard instruments taken at 9-0 a.m. and 9-0 p.m. local mean time. Returns are sent monthly to the Royal Meteorological Society, the Meteorological Council, the Scottish Meteorological Society, and many private observers in different parts of the Empire.

January.—An unprecedentedly mild month, being $7\frac{1}{3}$ degs. above the average. Very dull and sunless, and deficient in rain by fully an inch; no measurable quantity fell on any day from the 9th to the 29th. Wind light, only rising to the force of a gale on the 30th. Vegetable growth is everywhere apparent, and several of the spring songsters were heard throughout the month.

February.—Notwithstanding the cold of the last week the average temperature of the month is nearly 2·0 degrees above the normal. The first week was unprecedentedly warm, and the second and third week exceeded the average by fully 3·0 degs., while the last week fell to nearly 3·0 degs. below it. Rainfall a trifle over the average, and the number of rainy days considerably above it. Wind high, especially in the forenoons, rising to a gale on the 2nd and 14th from N.W. Only two days without bright sunshine. Vegetation, except in exposed situations, has suffered very little. Hawthorn hedges, elder trees, &c., budding.

March.—A cold month, fully 2·0 degs. below the average, with a preponderance of northerly winds, piercingly cold and unusually strong, with low night temperatures and frost on ground nearly every night. Less sunshine, less ozone, and less rainfall by nearly an inch than the normal. The growth of vegetation checked everywhere, and in exposed places buds and blossoms shrivelled up by the biting winds. Several showers of hail and snow fell during the month.

April.—A very normal month, with just a little less than the usual amount of rain and bright sunshine, with a prevalence of southerly and westerly winds and rather high night temperature. The cuckoo heard and swallows seen on the last week of the month. Vegetation well advanced.

May.—A dull, wet, and cold month, fully 2·0 degrees below the average temperature, and with a large proportion of cold easterly winds; very cloudy and deficient in bright sunshine. As much rain fell in 48 hours of the 21st and 22nd as the average amount for the month. Altogether, fully three times the average amount fell; due not only to the severe thunderstorm of the 22nd and 23rd, but to an excessive number of rainy days.

June.—A rather dull month, about 2·0 degs. below the average, arising from a deficiency of heat during the day. Just a fraction below the average rainfall. Many overcast days, and a large proportion of northerly winds; rather cold for the season, and only once (on the 24th) rising to the force of a gale.

July.—A very dry but otherwise normal month.

August.—A very wet and rather dull but warm month, the hottest day of the season being the 12th, with shade temperature at 80·7 degs. The high night temperatures are remarkable. The rainfall since the beginning of the year is now up to the average both as to amount and number of wet days. This adds another to a very remarkable and prolonged series of wet and disagreeable Augusts.

September.—An exceptionally fine month, the best for many years; in almost every respect the opposite of 1896; 2·5 degs. above the mean average temperature; sunny, clear, and dry; 1·6 inches less rain than the average, and

falling on seven days in gentle showers. Prevailing winds, south-westerly; very light. One drawback arose from the sudden drop in temperature towards its close, making a difference of 50 degs. between the hottest day and the coldest night—extremes which made it very trying for invalids.

OCTOBER.—A most remarkably mild month, 4·7 degs. above the average temperature, and having 11 days on which the temperature in the shade was over 60 degs., and 11 nights on which it did not fall below 50 degs. Fully half-an-inch more than the average rainfall took place, and it rained on an excessive number of days. This accounts for the large number of overcast days and the comparatively small average range of temperature. The winds were very variable and light, a rather remarkable circumstance considering the great range of pressure. October, 1886, was a very similar month.

NOVEMBER.—A mild month, 2·1 degs. above average temperature which would have been considerably higher but for the sudden drop on the third week, accompanied with a very heavy fall of snow for the season, about five or six inches having fallen in the early hours of the 24th. A little over half the average rainfall, making a deficiency of about 2½ inches since the beginning of the year. Wind had the force of a gale on the 2nd. On three nights there were 10 degs. or more of frost on the ground.

DECEMBER.—An exceptionally mild month, being 7·4 degs. above the average. Both the day and night temperatures are much higher than anything we have had for the past twenty years. The rainfall was nearly ¾ of an inch short of the monthly average, but the number of days on which rain fell was excessive. The annual rainfall is nearly 3¼ inches short of the average. There was more bright sunshine than for some years past, and the first week was very stormy; no less than three gales from the West. On the whole, the month had much more of the characteristics of a spring month—such as April—than those of a December.

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## EXPLANATIONS.

*The Barometer* readings, taken at 9-0 a.m. and 9-0 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9-0 a.m., and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9-0 a.m. and placed to previous day.

*Ground Temperature* read twice daily at 9-0 a.m. and 9-0 p.m. The lowest reading for the 24 hours, prior to 9-0 a.m., is entered to the previous day.

*Underground Temperatures* taken daily at 9-0 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew Point (as determined by Glaisher's Factors), by that corresponding to the temperatnre of the air (*i.e.*, the Dry-bulb reading.)

*The Rain* is measured at 9-0 a.m, and the amount entered to the previous day. A fall of 0·006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9-0 a.m. and 9-0 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8·0 an overcast day.

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Ozone* read at 9-0 a.m. (according to Dr. Moffat's Scale 0—12), and placed to previous day.

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | Hours ending Greenwich Mean Time of each Day of the Month. | | | | | | | | | | | | | | | | | Monthly. | | | Seasons. | Daily Cloud amount. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Forenoon. | | | | | | | Afternoon. | | | | | | | | | | Total Hours. | Greatest possible Percentage | No. of days without. | Hours and Percentage. | Mean. | Overcast. | Clear. |
| | 6 | 7 | 8 | 9 | 10 | 11 | Noon | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | | | | | | |
| Jan. ... | | | | ·25 | 1·58 | 3·34 | 5·00 | 6·76 | 5·31 | 2·25 | | | | | | | | 24·49 | 10·0 | 16 | Winter 175·16 23·0% | 8·1 | 18 | — |
| Feb. ... | | | 1·00 | 7·63 | 14·82 | 17·35 | 17·12 | 14·59 | 14·35 | 11·43 | 6·09 | ·25 | | | | | | 104·63 | 38·8 | 2 | | 6·2 | 6 | 2 |
| March.. | | ·55 | 5·02 | 11·00 | 13·85 | 15·89 | 16·98 | 17·90 | 14·70 | 12·83 | 11·99 | 7·05 | 1·33 | | | | | 129·09 | 36·0 | 2 | Spring 451·61 37·8% | 5·8 | 9 | 1 |
| April... | | ·58 | 10·95 | 11·67 | 13·63 | 15·12 | 12·91 | 15·18 | 15·72 | 16·08 | 14·99 | 14·46 | 8·33 | ·75 | | | | 150·39 | 36·0 | 5 | | 5·7 | 9 | 3 |
| May ... | | 5·58 | 11·67 | 14·14 | 14·00 | 15·41 | 14·23 | 15·32 | 15·65 | 17·66 | 14·59 | 12·50 | 11·83 | 8·24 | 1·25 | ·08 | | 172·15 | 35·4 | 5 | | 7·6 | 14 | — |
| June ... | 3·28 | 6·24 | 13·83 | 14·07 | 15·93 | 17·74 | 20·14 | 19·95 | 16·71 | 15·83 | 18·33 | 16·58 | 14·66 | 11·33 | 1·75 | | | 205·37 | 41·2 | 1 | | 7·0 | 14 | 1 |
| July ... | 1·75 | 8·32 | 13·65 | 14·97 | 19·23 | 20·99 | 23·15 | 20·65 | 19·83 | 18·49 | 19·33 | 17·16 | 14·74 | 12·75 | ·50 | | | 225·51 | 45·1 | 1 | Summer 597·84 41·1% | 6·3 | 7 | — |
| Aug. ... | | ·33 | 8·90 | 13·01 | 17·73 | 18·33 | 14·16 | 15·64 | 17·00 | 16·50 | 18·48 | 14·91 | 9·41 | 2·56 | | | | 166·96 | 37·1 | 3 | | 6·1 | 9 | — |
| Sept. ... | | 1·42 | 10·24 | 13·16 | 15·08 | 16·42 | 17·22 | 13·83 | 13·07 | 17·07 | 17·33 | 11·25 | 5·75 | | | | | 151·84 | 40·6 | 4 | | 5·5 | 8 | 6 |
| Oct. . | | | ·42 | 3·75 | 6·83 | 9·15 | 7·23 | 7·50 | 8·58 | 9·16 | 8·66 | 1·25 | | | | | | 62·53 | 19·4 | 13 | Autumn 274·65 28·0% | 8·0 | 17 | — |
| Nov. ... | | | | 2·06 | 5·83 | 10·99 | 9·32 | 10·57 | 10·83 | 8·91 | 1·67 | | | | | | | 62·28 | 24·0 | 12 | | 7·4 | 14 | 1 |
| Dec. ... | | | | | 1·08 | 8·40 | 11·16 | 11·75 | 9·91 | 3·74 | | | | | | | | 46 04 | 20·2 | 10 | | 7·4 | 15 | 4 |
| | 5·03 | 23·02 | 75·68 | 105·81 | 139·59 | 169·13 | 168·62 | 168·64 | 161·66 | 149·95 | 131·46 | 95·41 | 66·05 | 35·63 | 3·50 | ·08 | | 1499·26 | 33% | 74 | | 6·8 | 140 | 18 |

During Forenoon 686·88

During Afternoon 812·39

# METEOROLOGICAL OBSERVATIONS

## RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N.; Long. 11m. 36s. W.

| | MONTHLY SUMMARY O | | | |
|---|---|---|---|---|
| | JAN. | FEB. | MARCH. | APRI |
| PRESSURE (reduced to 32° F., and mean sea level)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 30·258in. | 29·915in. | 29·944in. | 29·8 |
| Highest reading | 30·615in. | 30·325in. | 30·391in. | 30·2 |
| ,, ,, Date of | 15 & 23 | 11 | 11 | 25 |
| Lowest ,, | 29·364in. | 29·187in. | 29·451in. | 29·3 |
| ,, ,, Date of | 1 | 21 | 29 | 11 |
| Range | 1·251in. | 1·138in. | ·940in. | ·8 |
| TEMPERATURE in shade (Stevenson's screen)— | | | | |
| Approximate mean | 45·4° | 41·6° | 40·6° | 48·2 |
| Mean maximum | 49·6° | 47·8° | 48·2° | 56·2 |
| Mean minimum | 40·8° | 35·3° | 33·4° | 40·6 |
| Extreme maximum | 57·8° | 59·7° | 59·9° | 66·0 |
| ,, ,, Date of | 30 | 1 | 18 | 8 |
| ,, minimum | 31·6° | 25·5° | 24·8° | 28·4 |
| ,, ,, Date of | 10 | 21 | 9 | 5 |
| Range | 26·2° | 34·2° | 35·1° | 37·4 |
| Mean daily range | 8·8° | 12·5° | 14·8° | 15·4 |
| Maximum daily range | 16·3° | 22·4° | 21·8° | 27·4 |
| ,, ,, Date of | 4 | 24 | 9 | 1 |
| Minimum ,, | 3·6° | 8·0° | 6·9° | 5·4 |
| ,, ,, Date of | 16 | 16 | 28 | |
| Number of nights at or below 32° | 2 | 9 | 15 | 2 |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 61·1° | 76·0° | 83·1° | 97·4 |
| Extreme maximum | 80·0° | 88·8° | 94·6° | 110·4 |
| ,, ,, Date of | 31 | 26 & 27 | 18 | |
| Greatest excess over shade maximum | 27·7° | 41·2° | 43·6° | 52·4 |
| Average ,, ,, ,, | 11·9° | 28·2° | 34·9° | 40·4 |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 37·3° | 30·1° | 29·5° | 35·4 |
| Extreme minimum | 28·3° | 20·8° | 21·3° | 23·4 |
| ,, ,, Date of | 10 | 22 | 9 | |
| Greatest difference from shade minimum | 8·6° | 8·3° | 8·5° | 9·4 |
| Mean ,, ,, ,, | 3·5° | 5·2° | 3·9° | 5·0 |
| Number of nights at or below 32° | 11 | 19 | 22 | 9 |
| TEMPERATURE underground | | | | |
| Mean at 1 foot | .. | ... | 40·4° | 46·4 |
| Range ,, | .. | ... | 11·3° | 7·4 |
| Mean at 2 feet | ... | ... | 42·4° | 45·4 |
| Range ,, | ... | ... | 4·8° | 5·4 |
| Mean at 3 feet | 45·2° | 44·8° | 43·2° | 45·4 |
| Range ,, | 1·6° | 3·2° | 2·8° | 4·4 |
| Mean at 4 feet | ... | ... | 43·5° | 45·4 |
| Range ,, | ... | ... | 2·1° | 3·4 |
| Air temperature, 9 a.m. | 44·0° | 41·4° | 40·0° | 48·4 |
| Range of ,, ,, | 20·0° | 24·0° | 28·1° | 11·4 |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 0·880 | 1·750 | ·760 | 1·4 |
| ,, ,, since 1st January | ... | 2·630 | 3·390 | 4·4 |
| Maximum fall in 24 hours | ·320 | ·360 | ·250 | ·6 |
| ,, ,, Date of | 4 | 3 | 1 | |
| Number of days 0·01 fell | 9 | 18 | 16 | 13 |
| ,, ,, since 1st January | ... | 27 | 43 | 56 |
| Mean relative humidity | 88 | 86 | 89 | 83 |
| Mean vapour pressure | ·257 | ·216 | ·212 | ·21 |
| Mean dew point | 40·9° | 36·5° | 36·2° | 4[illegible] |

# OF THE YEAR 1898.

ROAD, CHESTER.

OSPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| | JUNE. | JULY. | AUGUST. | SEPT. | OCTOBER. | NOV. | DEC. | YEARLY SUMMARY. |
|---|---|---|---|---|---|---|---|---|
| in. | 29·989in. | 30·111in. | 29·975in. | 30·078in. | 29·813in. | 29·826in. | 29·978in. | 29·968in. |
| in. | 30·350in. | 30·423in. | 30·288in. | 30·421in. | 30·411in. | 30·379in. | 30·463in. | 30·615in. |
| | 13 | 10 | 24 | 3 | 4 | 18 | 20 | 15 & 23 Jan. |
| in. | 29·389in. | 29·615in. | 29·601in. | 29·538in. | 28·873in. | 28·758in. | 29·051in. | 28·758in. |
| | 25 | 22 | 5 | 29 | 17 | 25 | 29 | 25 Nov. |
| in. | ·961in. | ·808in. | ·687in. | ·883in. | 1·538in. | 1·621in. | 1·412in. | 1·857in. |
| | 57·2° | 59·9° | 61·4° | 58·8° | 52·5° | 45·5° | 46·3° | 50·2° |
| | 66·4° | 69·1° | 70·4° | 68·4° | 58·3° | 50·3° | 50·9° | 57·8° |
| | 49·2° | 51·9° | 53·4° | 50·1° | 47·0° | 40·5° | 41·3° | 43·9° |
| | 76·8° | 75·5° | 80·7° | 79·9° | 67·5° | 61·5° | 60·5° | 80·7° |
| | 10 | 15 | 12 | 7 | 3 | 3 & 16 | 5 | 12 August |
| | 39·5° | 44·5° | 45·0° | 30·5° | 32·1° | 27·8° | 30·7° | 24·8° |
| | 1 & 2 | 5 | 7 | 25 | 13 | 29 | 28 | 9 March |
| | 37·3° | 31·0° | 35·7° | 49·4° | 35·4° | 33·7° | 29·8° | 35·1° |
| | 17.2° | 17·2° | 17·0° | 18·3° | 11·3° | 9·8° | 9·6° | 14·0° |
| | 29·9° | 27·7° | 28·4° | 29·3° | 25·9° | 17·0° | 17·6° | 29·9° |
| | 11 | 31 | 12 | 24 | 10 | 1 | 16 | 11 June |
| | 6·3° | 8·8° | 10·3° | 5·5° | 2·8° | 3·1° | 3·9° | 2·5° |
| | 30 | 19 | 31 | 30 | 18 | 11 | 1 | 21 May |
| | 0 | 0 | 0 | 1 | 0 | 4 | 2 | 35 |
| | 111·1° | 111·8° | 108·4° | 100·3° | 78·6° | 67·4° | 64·6° | 88·1° |
| | 121·3° | 121·5° | 123·5° | 116·8° | 98·8° | 92·5° | 80·5° | 123·5° |
| | 24 | 14 | 5 | 14 | 1 | 5 | 4 | 5 August |
| | 55·4° | 51·4° | 50·8° | 42·3° | 34·5° | 34·9° | 28·6° | 56·5° |
| | 44·7° | 42·7° | 38·0° | 32·2° | 40·3° | 17·1° | 13·7° | 32·0° |
| | 46·3° | 49·2° | 51·8° | 46·4° | 42·8° | 35·0° | 36·2° | 40·0° |
| | 35·8° | 38·5° | 42·0° | 31·0° | 30·6° | 20·7° | 24·5° | 20·8° |
| | 2 | 2 | 25 | 25 & 26 | 12 | 22 | 23 | 22 Feb. |
| | 9·6° | 6·9° | 11·5° | 7·5° | 8·9° | 9·5° | 9·9° | 11·5° |
| | 2·9° | 2·7° | 1·6° | 3·7° | 4·2° | 5·5° | 5·1° | 3·9° |
| | 0 | 0 | 0 | 2 | 2 | 11 | 10 | 86 |
| | 57·8° | 61·6° | 63·4° | 59·3° | 53·0° | 48·6° | 45·4° | 52·6° |
| | 6·9° | 5·6° | 5·1° | 10·9° | 5·1° | 11·7° | 8·2° | 7·6° |
| | 56·4° | 60·6° | 61·2° | 59·8° | 54·1° | 49·6° | 46·5° | 52·6° |
| | 5·3° | 3·7° | 4·5° | 7·1° | 3·7° | 8·4° | 4·2° | 5·0° |
| | 54·8° | 58·9° | 60·0° | 59·5° | 54·9° | 51·3° | 47·9° | 51·3° |
| | 4·5° | 3·3° | 1·8° | 4·0° | 3·1° | 6·4° | 2·3° | 3·3° |
| | 53·2° | 57·0° | 58·5° | 58·6° | 54·9° | 51·7° | 48·5° | 52·0° |
| | 4·0° | 3·0° | 1·1° | 2·2° | 3·0° | 4·9° | 1·9° | 2·7° |
| | 59·6° | 62·2° | 63·3° | 59·8° | 52·1° | 44·9° | 46·4° | 51·2° |
| | 19·9° | 14·3° | 17·5° | 29·5° | 20·8° | 24·7° | 24·4° | 20·4° |
| | 2·59 | ·740 | 4·025 | ·920 | 3·572 | 1·315 | 1·762 | 24·084 |
| | 11·750 | 12·490 | 16·515 | 17·435 | 21·007 | 22·322 | 24·084 | ... |
| | ·745 | ·340 | 1·280 | ·395 | ·755 | ·340 | ·770 | 1·280 |
| | 21 | 1 | 3 | 29 | 16 | 22 | 26 | 3 August |
| | 15 | 12 | 19 | 7 | 20 | 14 | 20 | 182 |
| | 90 | 102 | 121 | 128 | 148 | 162 | 182 | ... |
| | 84 | 79 | 81 | 83 | 90 | 90 | 86 | 85 |
| | ·387 | ·406 | ·438 | ·400 | ·368 | ·271 | ·267 | ·317 |
| | 57·4° | 53·1° | 55·1° | 53·3° | 49·0° | 42·2° | 41·9° | 46·1° |

## WIND AND OZONE.

| | Force. | | | Direction to 8 Points of the Compass. | | | | | | | | | Ozone. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean. | Maximum. | Date of. | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. | Mean Amount. | Maximum. |
| January | 1·2 | 7 | 30 | W | — | — | 3 | 2 | 4 | 21 | 14 | 8 | 10 | 1·7 | 6 |
| February | 2·0 | 8 | 2 | NW | 2 | 4 | 2 | — | — | 7 | 12 | 20 | 9 | 3·1 | 7 |
| March | 2·4 | 6 | 18 and 23 | W | 7 | 9 | 1 | 2 | 3 | 2 | 10 | 7 | 21 | 2·5 | 7 |
| April | 1·3 | 6 | 12 | S | 4 | — | 1 | 7 | 13 | 9 | 10 | 6 | 10 | 2·5 | 7 |
| May | 1·4 | 5 | 11 | NW | 5 | 5 | 8 | 3 | 5 | 6 | 9 | 14 | 7 | 2·3 | 7 |
| June | 1·7 | 7 | 24 | NW | 6 | 3 | 2 | 4 | 5 | 8 | 11 | 12 | 9 | 3·2 | 7 |
| July | 1·8 | 7 | 13 | NW | 7 | 2 | 1 | 2 | — | 1 | 15 | 23 | 11 | 3·1 | 7 |
| August | 1·6 | 5 | 5 | W | — | — | — | 4 | 8 | 11 | 14 | 12 | 13 | 1·8 | 7 |
| September | 1·3 | 5 | 2 | W | — | — | — | 9 | 7 | 11 | 12 | 10 | 11 | 1·4 | 6 |
| October | 1·1 | 3 | 20 and 30 | SE | 2 | 4 | 8 | 13 | 5 | 11 | 11 | — | 8 | 1·3 | 7 |
| November | 1·4 | 7 | 2 | SE | 6 | 1 | 3 | 13 | 8 | 1 | 9 | 7 | 12 | 1·3 | 7 |
| December | 2·0 | 7 | 1, 2, & 7 | W | 2 | — | — | 5 | 3 | 15 | 17 | 9 | 11 | 3·0 | 7 |
| | 1·51 | 8 | Feb. 2 | W | 41 | 28 | 29 | 64 | 61 | 103 | 144 | 128 | 132 | 2·3 | 7 |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | Thunder Storm. | Lightning only. | Thunder only. | Corona. | Gales. | Dew. | Aurora. | Snow. | Hail. | Frost. | Fog. | Hoar. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | — | — | — | — | 1 | 5 | — | — | — | 11 | 1 | 9 |
| February | — | — | — | — | 2 | 5 | — | 1 | — | 19 | 5 | 1 |
| March | — | — | — | — | — | 8 | — | 2 | 2 | 22 | 5 | 5 |
| April | — | — | 1 | — | — | 5 | 1 | — | — | 9 | — | 1 |
| May | 2 | — | 1 | 1 | — | 8 | — | — | — | 1 | — | — |
| June | — | — | 2 | — | 1 | 4 | — | — | — | — | — | — |
| July | — | — | — | — | 1 | 7 | — | — | — | — | — | — |
| August | 5 | — | 2 | — | — | 4 | — | — | — | — | — | — |
| September | — | — | — | — | — | 9 | 1 | — | — | — | — | 2 |
| October | 1 | — | — | — | — | 7 | — | — | — | 2 | — | 4 |
| November | — | — | — | 1 | 1 | 4 | — | 2 | — | 2 | 1 | 2 |
| December | — | — | — | 3 | 3 | 2 | — | — | 1 | 10 | 1 | 2 |
| Total | 8 | — | 6 | 5 | 9 | 68 | 2 | 5 | 3 | 76 | 13 | 26 |

## BIOLOGICAL NOTES, 1898—By Mr. A. O. WALKER, F.L.S.

*Communicated to the Zoological Section.*

### Scarcity or abundance of Wasps.

It has been generally believed that a wet May was prejudicial to Wasps by destroying the Queens at the beginning of their breeding season. This has been disproved this year at Colwyn Bay, for after the wettest May recorded in nineteen years—five inches of rain—Wasps were unusually abundant in August. Previous to that month they had done no damage to fruit, confining themselves to the "honeydew"—secretion from aphides—which was very abundant in early summer; but after that they were most destructive to plums, &c. Col. Davies-Cooke, on the other hand, said they were very scarce about Mold. There was no frost in May at Colwyn Bay, the lowest shade temp. at Nant-y-Glyn having been 34·6°, but in all probability it was much colder near Mold. It would, therefore, appear to be low temperature in May, rather than rain, which destroys the Queens.

### Starlings and Blackbirds.

Starlings are abundant in my garden at Nant-y-Glyn, yet I have never seen them take fruit of any description. Blackbirds, on the other hand, which are commoner on the Coast of North Wales than in any part of the country I know, are excessively destructive to fruit. I have seen them stripping an Arbutus of its berries in autumn, while the Starlings sat on the topmost branches of a thorn immediately above them without taking any part in their ravages. Yet it is well known that, in some places, Starlings are destructive to fruit, especially cherries, and the President of the Society (Mr. J. D. Siddall) says he has seen them devouring these and keeping the Blackbirds away! This confirms what I have noticed with other birds and animals, viz., that a statement which is true about their habits in one locality is not necessarily so in another.

## NATURAL HISTORY NOTES—By Mr. J. D. SIDDALL.

### Roosting of Swallows.

During the later part of August and until near the end of September last year, the telegraph wires crossing the meadows and river above the "Red House," were in the evening the assembling place for many thousands of Swallows. They alighted on the wires prior to settling for the night in an adjacent patch of osier willows—a few acres in extent—in a meadow at the foot of Messrs. Dicksons' Nursery. The noise made by so great a number of birds settling down on the stems resembled that of a mowing machine at work. If, when the birds had settled, stones were thrown among the willows they would rise and circle rapidly in clouds for a short time, but would speedily return to their roosting places again. Several would cling upon a single stem, which would bend over with their weight, and it was easily possible to take a bird by hand by creeping in among the osiers when they had settled. A workman at the Nurseries said that this had been a great roosting place—after the breeding season—for several years past, but he did not remember such great numbers before. He also said they came there for about six weeks before going away. I had in previous years seen them roosting in the reed beds on the Serpentine, Eaton, but not in the meadow osier beds, or anything near such vast numbers. When watching them one night I witnessed a remarkable conflict between the Swallows and a Weasel. The latter crept across a meadow towards the osier bed, but was observed and fiercely attacked by the Swallows, which swooped down

close past it with loud cries, almost if not quite touching it with their wings. These tactics so confused and apparently terrified the Weasel that it leaped about in the most violent manner, sometimes throwing itself quite on its back, and striking at the Swallows with its feet and jaws. The Swallows, however, ultimately drove the Weasel off, for it finally bolted at top speed away from them and found refuge in a hedge.

### The Small Ermine Moth.

For several years past the hawthorn hedges on the south side of the City have become infested, at the end of May and early in June, with the nests of Caterpillars of the Small Ermine Moth. Later they attack the apple trees, on which they become a serious pest, but they do not much favor the pears or stone fruit, or raspberries; although all rosaceous fruit plants seem more or less liable to the pest. This year again they are very troublesome, and nothing except hand picking seems to be effective in clearing them. Protected as they are by a web, no birds seem to touch them.

### Starlings and Fruit.

As it seems to be a somewhat unusual occurrence and indicative of the different habits of birds in different localities, it is perhaps worth while recording that for several years past the Starlings in my orchard eat both cherries and apples—late apples especially. They last year appropriated a tree of Yorkshire Greening, which being somewhat buried by other trees had not fully ripened its crop by December 12th. On this date, however, we were obliged to gather what the Starlings had left us, and their protests against our interference were as vigorous as only Starlings can make when their little plans are interfered with.

### Growth of Fruit Trees.

The great heat of September last had a remarkable effect in prolonging the growing period of fruit trees in the district, and proved also very favourable to the formation of flower buds. When pruning a pear tree during the winter I cut two shoots from the centre of it. Both were entirely last year's growth. One was 6ft. 3in. and the other 5ft. 10in. in length. There were over 50 leaves on each. For four-fifths of their length the wood was firm and well-ripened. Unfortunately, the abundant flower bud production was neutralised by the ungenial conditions this spring, stone fruit and pears being very badly caught, and even the apples much diminished by the cold of April and May.

### Misletoe Planting.

I have rubbed the berries of misletoe into the crevices of several apple trees on which I was anxious to watch it germinate. It did not germinate in any case where I had rubbed it, but has done so on two other trees where I presume the birds have transferred the seeds.

### First appearance of Spring Flowers.

Comparative notes on the first appearance of spring flowers are apt to be very misleading except the same plants and habitats can be noted from year to year. As the meteorological conditions have however a very direct influence on plant life, I append a short table for comparision with the Rev. J. C. Mitchell's tables:—

First appearance in flower of—

| | 1897. | 1898. | 1899. |
|---|---|---|---|
| Snowdrop | Feb. 1st | Jan. 6th | Jan. 16th. |
| Crocus | Feb. 20th | Jan. 26th | Feb. 12th. |
| Celandine | Feb. 14th | Jan. 18th | Feb. 12th. |
| Hazel | Feb. 14th | Jan. 15th | Feb. 10th. |
| Coltsfoot | Feb. 25th | Feb. 3rd | March 12th. |

## NOTES BY DR. HERBERT DOBIE.

Interesting Moths taken by Dr. Herbert Dobie at the Electric Lights of Chester, during the latter half of the year 1898:—

(1) New records for the District—

*Sphinx ligustri*—At Boughton, on July 15th.

*Platypteryx hamula*—On August 19th, at the Watergate.

*Tethea retusa* } Both taken in August.
*Pyralis glaucinalis* }

(2) Moths formerly considered scarce in the District, but which have been common at the lamps—

*Leiocampa dictæa*—17 or 18 specimens were taken.

*Calamia lutosa*—Several specimens.

*Mamestra persicariæ*—Sparingly.

*Agrotis nigricans*—Common.

,, *porphyrea*—Many.

*Triphæna fimbria*—Three.

*Noctua C-nigrum*—Common.

*Cucullia umbratica*—Was exceedingly common.

*Ennomos fuscantaria*—Hardly recorded previously; was taken in such abundance in September that its capture was discontinued.

*Geometra papilionaria*—Fairly common.

(3) Rare Moths of which one or two specimens were taken—

*Chærocampa elpenor.*
*Cerura furcula.*
*Leiocampa dictæoides.*
*Notodonta camelina.*
*Diloba cæruleocephala.*
*Petusa cassinea.*
*Bombyx neustria.*
*Drepana falctaria.*
*Luperina cespitis.*
*Cirrædia xerampelina.*
*Plusia festucæ.*
*Ennomos erosaria.*
*Himera pennaria.*
*Chesias spartiata.*

(4) Other species of interest—

*Amphidasis betularia*—Only the black variety was taken last year; but this year, up to the time of writing, I have taken several types and intermediate forms of this Moth, of which a separate account will appear in the next Proceedings.

*Fidonia piniaria*—Tolerably common amongst the Pines in Delamere Forest, was taken at the lamps.

I have to acknowledge the assistance given to me by my brothers Messrs. Douglas and E. Cyril Dobie, and also by Mr. R. W. Shand and Mr. W. J Anderson, to whom I am indebted for a number of the specimens recorded above.—H. D.

## NOTES BY MR. J. ARKLE.

FLOWERS IN BLOOM, SPRING 1898.—Daisies were plentiful, Jan. 1st, in the fields between Chester and Saltney. The almond, crocus, scilla, and American currant, were in bloom as early as the end of February. Blackthorn began to blossom April 16th, and the primrose, ground-ivy, wood-sorrel, anemone, orchid, and violet, were out along the Leet April 23rd. The hawthorn and horse-chestnut were in bloom May 7th, and lilac and laburnum May 9th. The oak was out in leaf (May 14th) before the ash, and yet there was no "splash" of a summer. As a matter of fact the oak, in this district, is nearly always—if not always—in leaf before the ash.

BIRDS.—Cuckoo heard April 23rd—two days earlier than in 1897. Swifts were seen May 2nd—two days earlier than in 1897.

INSECTS.—Glow-worms were pointed out to me by Mr Thompson, 24, South View, on the Sealand Cop, June 24th.

## "The Distribution of Animal Life"—By Mr. W. E. SHARP, (Ledsham.)

*(Read before the Zoological Section.)*

This Paper dealt with the problems of the immediate origin of the various forms of animal life at present existing within the British Islands, or what is known to science as faunistic distribution, and referred to the extreme difficulty involved in the attempt to formulate any adequate or satisfactory explanation of the facts of the case. The lecturer confined his remarks principally to the consideration of one order of insects, the *Coleoptera*, and showed how in this group three elements might be discovered, the first division containing species now of northern and north-western range, whose origin may probably have been from an extension of North-western Europe, which at one time joined Scotland, Norway, and Greenland, and closed in the Atlantic Ocean to the north. On this hypothesis the presence of the vestiges of a North American element in the Irish fauna may be explained. The second group, containing the majority of our fauna, probably arrived from the eastward, and its ultimate origin possibly Siberia. This immigration could not have succeeded in establishing itself in England before the land continuity between Great Britain and Ireland must have become interrupted, the Irish fauna being conspicuously deficient in this group. The third group comprises species of extreme Southern and South-western range of discontinuous distribution, and very perplexing both in its origin, age, and lines of progression. The age and relative sequence of these waves of immigration was another and much more difficult question. Here Geological factors were involved, and more especially the view taken of the extent, duration, and severity of the glacial period. The lecturer, after briefly alluding to some of the current theories on this subject, expressed the belief that the evidence at our command was not at present sufficient or reliable enough to formulate any theories upon, and concluded by pointing out that the accumulation and systematic recording of the facts of distribution was one of the most useful and obvious functions of any local Natural Science Society, and the only means by which we might ever hope to become possessed of evidence sufficient to support any intelligible theories of the phenomena of the present distribution of our fauna.

# "The Geognostic Relations of the Flora of North Wales"—By Mr. J. LLOYD WILLIAMS.

*Read before the Botanical Section.*

I.—Objects of the Lecture—

1. To show that the Geological factor, particularly the structure and chemical constituents of the underlying rocks, exercises a greater influence on the distribution of plants than is generally conceded;

2. Seeing that North Wales has such a variety of rocks, the Flora of which can be easily compared and contrasted within small areas, to see whether it be not possible for Botanists to work the district systematically and to put on record the observations so made.

II.—The relation of plants to inorganic food substances—particularly lime, potash, and phosphoric acid—briefly explained.

III.—Illustrations of the dependence of the Flora on the Geological formations given from the various Counties—

1. Anglesey—The Gneiss and Schists, the old Red Sandstone, the Lower Silurian and the Limestone formations.

2. Carnarvonshire—The Slates and Sandstones, the Volcanic Rocks (particularly the Acid Lavas), the Diabases and the Calcareous Volcanic Ashes of the Snowdon district, the Limestones of the Great Orme, and the Drift in various parts of the County.

3. Denbighshire—The Wenlock Shales between the Conway and the Clwyd Valleys, the Limestones in the Vale of Clwyd, and the barren Sandstones above Pentrevoelas.

4. Merioneth—Slates of the Cambrian formation, the barren Grits above Harlech and Llanbedr, the Volcanic Rocks of the Cader Idris district, &c.

In the above districts the dependence of the configuration of the Country on its Geology was shown by means of lantern slides; some analyses of rocks were also shown, and lists of the characteristic plants of the various localities given.

IV.—In conclusion it was urged that lists of plants found within arbitrary Geographical limits—such as County boundaries—had no scientific interest or value. On the other hand, all attempts to trace the causes of the present distribution of our Flora are of the greatest value to Geographical Botany. Watson in his Cybele has done admirable work for "County Botany,"—we now want to advance beyond the lines laid down by him. North Wales is an admirable district for this kind of study, but the work cannot be done without co-operation. It was strongly urged that it was the duty of the Botanists of the Chester Society of Natural History, and of those connected with the University College of North Wales, to initiate this work. Botanists wishing to exchange ideas on this subject might correspond with the Chairman of the Botanical Section of this Society (Mr. J. D. Siddall), or with the Lecturer (Mr. J. Lloyd Williams, University College, Bangor.)

## "The Microscopical Structure of Coal Plants"—By Mr. W. W. MIDGLEY, F.R.Met.S.

*Read before the Geological Section.*

By an admirable series of lantern views Mr. Midgley illustrated and explained the cellular structure of Coal Plants. This was demonstrated by photomicrographic as well as nature-printed—that is printed by contact with the microscopic section—transparencies. The types of plants dealt with were—Lepidodendrons, Sigillarias (with the roots Stigmaria), Lyginodendrons, Calamites, Sphenophyllites, and Ferns. The arrangement of the different parts of the vascular cryptogams, in transverse, tangential, and longitudinal section, were shewn, as well as the fruits, and the details of structure and their affinities with recent plants pointed out.

## "Wehnelt Electrolytic Break"—By Rev. A. H. FISH, B.A., B.Sc.

At a Meeting of the Society on April 6th, 1899, the REV. A. H. FISH exhibited and explained the new Wehnelt Electrolytic Break, applied to Induction Coils and X-ray Photography.

The break was worked from the 210 volt Town Supply in connection with a six-inch and ten-inch Induction Coil.

The Lecturer drew attention to the peculiar nature of the discharge, and to the transformation of, or superposition upon, the direct current of an alternate current of higher voltage due to the break.

An opportunity was also afforded of comparing the results produced by an ordinary mechanical Contact-breaker, a Motor-driven Mercury-break, and the Wehnelt Break, when used in connection with an X-ray Tube and Fluorescent Screen.

## "Wireless Telegraphy"—By Mr. T. HETHERINGTON.

*Read before the Natural Philosophy Section.*

The Paper was a review of the magnetic induction methods of wireless telegraphy introduced by Mr. W. H. Preece, Mr. Sidney Evershed, and Dr. Oliver Lodge, and the Hertzian Wave Method of Signor Marconi. Magnetic induction between wires followed well-known laws. Mr. Preece arranged his circuits after the manner of ordinary telegraph lines with an earth return, while Mr. Evershed used horizontal coils and rectangles of large area. The latter's experiments revealed a new phenomenon in the absorption by sea-water, which militated against the use of the method for lightship purposes for which it was designed. The application of the principle of syntony by Dr. Lodge was the most interesting recent advance. His (Dr. Lodge's) experimental demonstration, in 1881, that the discharge of a circuit possessing inductance and capacity—and consequently a natural period of oscillation—induced sympathetic resonance in a similar circuit, suggested the use of tuned circuits. In practice horizontal coils were used, and the period of vibration was regulated by the use of condensers in circuit. With syntonic circuits it was possible to span distances otherwise commercially impracticable; and intervening obstacles—such as the buildings of

a city—affected these long magnetic waves but little. Having distinguished between the long waves of the magnetic induction methods of the above workers, and the short waves of Hertz—in which the magnetic and electric forces acting together constituted true radiation—the Paper detailed Signor Marconi's application of the latter to the purposes of wireless telegraphy. The vertical wire and earth connections to the transmitter and receiver, and the evolution of the coherer into a telegraphic relay—which were Marconi's especial achievements—were described; and the system was illustrated by a set of apparatus shewn transmitting signals across the Lecture Theatre, and actuating a Morse instrument as in daily work.

## PAXTON SOCIETY.

We are glad to be able to report quite favorably of the progress of the Paxton Society. Its numbers and utility continue to increase. The annual Fruit and Chrysanthemum Exhibition held in the Town Hall last November was a great success in every way, and we hope the Members will note and prepare for this year's show, which will be held on 14th and 15th November. Schedules may be had from the Hon. Secretary, or any Member of the Committee.

The following is a list of the Saturday Evening Meetings held during the past Session; all were well attended and of great interest:—

1899.

JAN. 7—Social Gathering of Members.

,, 21—Conversational Discussion on Chrysanthemums. Introduced by MR. E. STUBBS.

FEB. 4—"The Structure and Functions of Plants" (with Lantern Illustrations) .....MR. J. D. SIDDALL.

,, 18—"Recently introduced Fruit Pests" (Illustrated by Lantern Slides).....MR. R. NEWSTEAD, F.E.S.

MAR. 4—"Orchids" .....MR. R. TODD, Woolton.

,, 18—"Notes on the Potato" .....MR. J. TAYLOR.

APRIL 1—"Hardy Herbaceous Flowers" .....MR. R. WAKEFIELD.

J. WYNNE, *President.*
G. P. MILN, *Secretary.*

# KINGSLEY MEMORIAL PRIZES

ARE OFFERED AS FOLLOWS:—

**To any Resident in the Society's District.**—A PRIZE not exceeding TEN POUNDS for the best COLLECTION OF OBJECTS, OR ESSAYS, OR NOTES OF OBSERVATIONS, OR PHOTOGRAPHS illustrating the Natural Science of the Society's District. The amount given will be proportionate to the *quality* of the Collection.

The Committee would specially welcome a revision of the *Phanerogamic Flora* of the city and neighbourhood, and also contributions towards a knowledge of the *Fungi*.

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All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the persons competing.

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*The Collections, Essays, or Notes must be sent in to either of the General Secretaries on or before 1st September, and the awards will be made at the Conversazione next succeeding the adjudication.*

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**NOTE.—The Committee have the option of retaining the successful Collections, &c., or any part of them, for the Society.**

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Intending Competitors can obtain all particulars, and the conditions under which the Prizes are offered, from either of the General Secretaries; and all Collections, &c., must be sent in to either of them on or before the 1st September in each year.

# PAST PRESIDENTS.

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Hervey, The Hon. & Rev. Manners W...Lynwood, Brook lane
*Hetherington, Mr. T .....Telegraph Department, Post Office
Hewitt, Mr. David L. .....Abbey House, Northgate street
Hickey, Mrs. .....2 Victoria pathway, Queen's park
Hickman, Mr. F. F. .....8 Northgate street
Higgins, Miss Eva .....The Manor, Overleigh
Higgins, Miss Millie..... " "
Higginson, Mr. T. .....1 South view, Eaton road
Hignett, Mrs. .....14 Hough green
Hignett, Mr. A. H. ..... " "
Hignett, Mrs. T. H. .....Shandon, Hough green
Hilton, Mrs. .....Talbot Hotel
Hincks, Mr. J. W. .....Brantwood. Brook lane
Hobday, Mr. J. .....Alexandra Villa, Liverpool road
Hobday, Mr. E. ..... " "
Hobday, Mr. Jas., M.B., B.A. ..49, Upper Bedford place, Russell square, London, W.C.
Hodge, Mr. J. R. .....23 Liverpool road
Hodge, Mrs. ..... " "
Hodge, Mr. E. G. ..... " "
Hodge, Miss Constance ..... " "
*Hodges, Mr. W. .....31 Hough green
Hodges, Miss A. G. ..... " "

Hodkinson, Mrs. .....39 White Friars
Hodkinson, Mr. E. ..... " "
Holditch, Mr. A. H. .....c/o Messrs. Quellyn Roberts & Co., Watergate street
Holland, Miss .....11 Derby place, Hoole road
Holme, Rev. Canon, M.A.....Great Budworth, Northwich
Holmes, Mr. J. G., J.P. .....Belmont, Curzon park
Home, Miss R. .....1 Lumley road
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopkins, Dr. T., B.A.....60 Watergate street
Hopkins, Mrs. ..... " "
Hopley, Mr. J. H. .....6 Northgate street
Hopton, Mrs. ..... .....6 Cheyney road
Hornby, Mr. Alex. .....Leyden Villa, Louise street
Hostage, Mr. George B. .....28 Eaton road
Hostage, Mrs. ..... " "
Hostage, Miss .....22 Eaton road
Howson, Rev. J. F., M.A.....Egerton House, Upper Northgate street
Howson, Miss ..... " " "
Howson, Rev. G. J., M.A.....Christ Church Vicarage, Crewe
Hudson, Mrs. R. S. .....Bache Hall, Chester
Hughes, Mrs. McKenny .....18 Hills road, Cambridge
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Hull, Mr. G. S. N. .....19 Gladstone Avenue
Humberston, Miss.....Newton Hall, Chester
Humphreys, Mr. E. Noel.....Caer y Cael, Hoole
Humphreys, Mrs. ..... " "
Humphreys, Miss Lilian .....5 Hamilton street, Hoole
Hunter, Mr. Jas. .....Maisonette, Hough Green
Hunter, Mrs. ..... " "
Hunter, Mr. Jas. De Graaff..... " "
Hutchings, Mr. J. H., Senr. ....47 White friars
Hutchings, Mr. J. Hanmer .....20 Bouverie street
Hutchinson, Mr. Thos.....48 Frodsham street
Hutton, Rev. E. A., M.A.....Hargrave Vicarage, Chester
Hyde, Deaconess Violet .....Diocesan Deaconess Institution

Jack, Mr. A. S.....Belle Vue, 36 Hough green
Jackson, Mr. Roger, J.P. .....26 Hough green
Jackson, Miss..... " "
Jackson, Mr. Robert .....8, Denbigh street
James, Rev. T. D. .....Athol House, Brook lane
*Jebb, Mr. G. R., C.E.....Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A., M.B, L.R.C.P., M.R.C.S. } 13 Lorne street (North)
Jepson, Mr. Arthur .....6 Walpole street
Johnson, Major .....9 Upper Northgate street
Johnson, Mrs. .....11 Bertram road, Sefton park, Liverpool
Johnson, Mr. .....St. Paul's School, Boughton
*Johnson, Mr. M., L.D.S.I.....9 York villas, Lorne street
Johnson, Mr. Thomas C.....Bod Asaph, Chichester street
Johnson, Mr. Alfred .....Norton Villa, Upton park
Jolliffe, Mr. H. D. .....Holly bank, Queen's park
Jones, Miss.....The Northgate
Jones, Mrs. Edward .....1 Derby place, Hoole
Jones, Mr. Jno. .....5 Lorne street (North)
Jones, Mr. F. M. ..... " "
Jones, Mr. David Brellisford ....11 St. Anne street
Jones, Rev. D. Treborth .....Eryl, Hoole road
Jones, Mr. W. S. .....North & South Wales Bank
Jones, Mr. Owen E., J.P. ..... Tynrheol, Amlwch

Jones, Mr. Fred. ..... 26 Frodsham street
Jones, Mr. H., A.C.A. ..... 14 Lord street
Jones, Miss ..... 2 Hunter street
Jones, Mrs. W. H. ..... 4 Abbey street
Jones, Miss F. Bannister ..... ,, ,,
Joyce, Rev. G. C., M.A. ..... St. Deiniol's Hostel, Hawarden
Joyce, Rev. F. Hayward ..... 9 Abbey square
Joyce, Miss Laura ..... ,, ,,
Joyce, Miss Eldela ..... ,, ,,

Kelsall, Miss H. ..... Abbot's court, Liverpool road
Kenyon, Mr. G. A., M.B. ..... Flookersbrook
Kenyon, Mrs. ..... ,,
King, Dr. H. W. ..... 26 Nicholas street
King, Mrs. ..... ,, ,,
King, Mr. Fred. F. ..... 7 Bold square
*Kingsley, Miss ..... 3 Bullingham Mansions, Pitt street, Kensington, W.
Knight, Mr. ..... Rhianfa, Bull Bay, Amlwch
Knight, Mrs. ..... ,, ,, ,,
Knowles, Mr. E. R. ..... Grosvenor street
Kynnersley, Mr. E. M. Sneyd .. Boughton Lodge

Lacy, Mrs. ..... Moore Holme, Neston
Laing, Miss S. C. ..... 7 Chester street, Saltney
Lamont, Mr. A. ..... 3 City Walls (West)
Lamont, Mr. A., Junr. ..... ,, ,,
Lamont, Miss ..... ,, ,,
Lanceley, Mr. R. H. ..... Victoria road
Latham, Mr. J. S. ..... Green bank, Liverpool road
*Lawrence, Dr. A. ..... The Asylum, Chester
Leader, Miss ..... 4 King's buildings
Ledsham, Mr. Wm. ..... Coal Exchange
Lees, Mr. W., M.R.C.S. ..... The Bars
Leete, Mrs. ..... Vicarage road, Hoole
Leete, Miss ..... Talbot Hotel
Lewis, Rev. J. S., M.A. ..... Newtown Rectory, Mont.
Little, Mr. W. E. ..... 24 Hough green
Littler, Miss ..... 132 Overleigh road, Handbridge
Lloyd, His Honour Sir Horatio .. Stanley place
*LLoyd, Major Wilford ..... Eccleston Hill, Chester
LLoyd, Mrs. ..... ,, ,,
Lloyd, Mrs. E. ..... Abbot's mount, Liverpool road
Lloyd, Miss M. E. ..... 13 Chichester street
Lloyd, Miss C. ..... 56 Princess street
*Lockwood, Mr. T. M., F.R.I.B.A 80 Foregate street
Lockwood, Mrs. ..... 7 Queen's park
Lomax, Mr. F. T. ..... 20 Bold square
Lomax, Mr. Fredk. Eagle ..... ,, ,,
Lomax, Mr. Hy. Chas. ..... ,, ,,
Long, Mrs. ..... 2 Lumley road
Long, Miss F. ..... ,, ,,
*Longbottom, Mr. F. W. ..... Haslemere, Queen's park
Longbottom, Mrs ..... ,, ,,
Lowe, Miss C. H. ..... 25 Hough green
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. 9 Hough green
Lowe, Mrs. ..... ,, ,,
Lowe, Mr. Jas. F., B.A. ..... Dee Banks
*Lucas, Mr. A. W., F.G.S. ..... 7 Victoria pathway, Queen's park
Lumby, Mr. Arthur H. ..... Hamilton terrace, Upper Northgate street
Lyon, Rev. J., M.A. ..... 7 Grey Friars

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Mr. G. E. ..... " "
*Macdonald, Miss Eva ..... " "
Maddocks, Mr. Frank .....Dee Banks
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Mann, Mr. A., M.B. ..... ...Newgate street
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Manning, Miss Edith .....18 Upper Northgate street
Marriott, Mr. J. W. .....The Grosvenor Museum
Marsden, Miss ..... .....6 Grosvenor park road
Mason, Mr. F. B. ..... .....1 Exton park
Mason, Mrs. ..... " "
Mason, Mr. J. Clarkson .....9 Chichester street
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
Matthews, Mr. W. G. .....Inland Revenue Office
McCulloch, Mr. A. M. .....Lime Grove
McCulloch, Mrs. ..... ..... "
McEwen, Mrs. .....83 Alexandra terrace, Hoole road
*McMichael, Mr. J. A., B.A., B.Sc .39 Parkgate road
McMichael, Mrs. ..... " "
McIneray, Mr. A. J. .....1 Allington terrace, Hoole road
Meacock, Miss ..... .....West Hey, Hough green
Meeson, Mr. W. H. .....21 Bold square
Middleton, Mr. G. .....1 Sandown terrace
Middleton, Mrs. ..... " "
Mill, Miss F. ..... ..... .....24 Eaton road
Millington, Mr. C .....Victoria House, Victoria road
Millington, Mrs. ..... ..... " "
Mills, Mrs. ..... .....Derby House, Hoole
Mills, Mr. T. .....Union Hall, Foregate street
*Miln, Mr. G. P. ..... ..... .....Milnholme, Brook lane
Miln, Mrs. ..... " "
Minns, Mr. Alfred ..... .....19 Cecil street, Boughton
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Minshull, Mr. C. H. .....Lorne street
*Mitchell, Rev. J. C., B.D., F.R.A.S. .Rutland Cottage, Parkgate road
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Musgrave, Miss ..... ..... " "
Musgrave, Miss C. ..... " "
Muspratt, Mr. E. J. ..... .....Within Croft, Dee Banks

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New, Mr. Henry ..... .....14 Crane street
Newman, Mr. J. E. .....Sunny Bank, Queen's park
Newman, Mrs. ..... " "

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Newstead, Mrs. .....10 Chester road, Saltney
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Nicholson, Mr. J. M. .....Liverpool road
Nicholson, Mr. R. Leonard St. Clair ,,
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Nutting, Miss F. A. ..... ,, ,,

Ockleston, Mr. Wm. .....Abbey House, Flookersbrook
Ockleston, Mrs. ..... ,, ,,
*Okell, Mr. E. W. .....22 Northgate street
*Okell, Miss M. H. .....Overdale, Upton
Oldfield, Mrs. .....68 Northgate street
Oldfield, Miss .....Bryn Clwyd, St. Asaph
Orton, Mr. R. O., J.P. .....Tattenhall, Chester
Owen, Mr. A. .....3 Bouverie street

Parker, Mr. George .....11, Eaton road
Parker, Mrs. ..... ,,
Parkes, Mr. A. .....Bridge street row
Parkes, Miss ..... ,, ,,
Parry, Mr. Gilbert .....Farndon Hall, Chester
*Parry, Mr. T. S., M.B. .....10 Upper Northgate street
Parry, Mr. Morris .....21 Victoria road
Parry, Mr. Robert .....Westcote, Hoole road
Parry, Miss Kate .....Blossoms Hotel
Payne, Miss .....4 Abbey green
Payne, Miss A. ..... ,, ,,
Perry, Miss .....12 Stanley place
Phillips, Mr. A. D. .....National Provincial Bank
Phillipson, Mr. J. .....23 Liverpool road
*Phillipson, Mr. H. G., B.A. ..... ,, ,,
Plaistow, Mr. A. W. .....3 Deva terrace
Porter, Mrs. .....Crowthorne, Childer Thornton, Chester
Potts, Mr. A., M.A. .....Diocesan Training College
Powell, Mrs. T. J. .....37 White friars
Powell, Miss .....38 Eastgate row
*Price, Mr. Walmsley .....26 Watergate row
Priest, Mr. W. B. .....Gresford
Prichard, Mr. Geo. .....9 The Groves
Prichard, Miss ..... ,,
Pritchard, Mr. W. .....26a St. Martin's fields
Pritchard, Mr. Harold .....The Hollies, Upton park
Pritchard, Miss .....George street
Pritchard, Mr. T. N. .....Ramsgate villa, Tarvin road
Pryce-Browne, Miss H. J. .....68 Bouverie street
Pye, Mr. James .....Wilton House, Brook lane
Pye, Mrs. ..... ,, ,,
Pye, Mr. Fred. A. .....18 Granville road
Pye, Mrs. F. A. ..... ,, ,,

Quayle, Mr. Wm. F. .....Parr's Bank, Limited, Chester
Quinn, Mr. F. J. .....Princess street

Rayner, Miss .....Ash grove, Wrexham road
Read, Lieut.-Col. .....Kenwyn, Dee banks
Read, Mrs. ..... ,, ,,
Read, Miss ..... ,, ,,

Reynolds, Mr. G. H. .....Rock Mount, Liverpool road
Reynolds, Mrs. ..... ,, ,,
Richardson, Mr. A. .....Bridge street row
Richmond, Mr. F. .....Newton House, Chester
Richmond, Mr. Walter C. .....Ivy Rock, Christleton
Rigby, Mr .....15 Victoria road
Rigby, Mrs. ..... ,, ,,
Roberts, Miss .....Bank Cottage, Neston
Roberts, Miss M. ..... .....8 Nicholas street
Roberts, Dr., J.P. .....8 Abbey square
Roberts, Mr. Lloyd, L.R.C.P., M.R.C.S...8 Abbey square
Roberts, Miss Johnson .....7 Lumley road, Liverpool road
Roberts, Mr. B. C. J.P.....Oakfield, Upton
Roberts, Mrs..... ,, ,,
Roberts, Mr. W. F.....Well House, Chester
Roberts, Mr. J. Sheriff .....Curzon park
Roberts, Mrs. ..... ,,
Roberts, Mr. J. .....9 Lightfoot street
Roberts, Mr. T. .....32 St. Martin's-in-the-fields
*Roberts, Rev. H. D. .....Brook Lodge, Brook lane
Roberts, Mrs. ..... ,, ,,
Rogers, Mr. James .....Eastgate row (North)
Rogers, Mr. W. .....Watergate flags
Rogerson, Mr. G. H. .....Polefield, Liverpool road
Royle, Mrs. .....Hough Green House
Royle, Mr. W. .....20 Bouverie street
Royle, Mrs. ..... ,, ,,
Ryde-Jones, Mr. T. .....Union Bank House, The Bars

Salmon, Miss Maud .....2 Grosvenor place
Sandbach, Mr. S. H., J.P. .....Cherry Hill, Malpas
*Sandford, Mrs. Henry ..... .....Queen's School
Sant, Mr. T. ..... .....Frodsham
Savage, Colonel..... .....The Limes, 27 Hough green
*Schröder, Mr. W. G. ..... .....Eaton road
Scotland, Mrs. ..... .....Vicar's lane
Scott, Mr. John..... .....Brook Lane
Scott, Rev, Canon S. Cooper, M.A. ..St. John's Rectory
Scott, Surgeon-Colonel, C.M.G..Watergate House
Segar, Mr. F., L.D.S.E.....White Friars House
Shand, Miss E. M. .....Kingston House
Shand, Miss E. F. ..... ,,
Sharpe, Mr. F. W. ..... .....7 Abbey Square
*Shepheard, Mr. T., F.R.M.S.....Kingsley, Bournemouth
Shepheard, Mr. W. F. J., F.C.S..Bridge street row
Shepheard, Mrs. ..... ,,
Shepheard, Mr. J. D. .....National Provincial Bank, Wrexham
*Shone, Mr. W., F.G.S. .....Upton park
Shone, Mrs. ..... ,,
Shone, Mr. Wm., Junr. ..... ,,
Shrubsole, Mr. Alfred .....Town Hall square
*Siddall, Mr. J. D. ..... .....19 Eaton road
Siddall, Mrs. ..... ,,
Siddall, Miss Annie ..... ,,
Siddall, Miss G. M. ..... ,,
Siddall, Mr. W..... ,,
Siddall, Mr. Chas. Kingsley .... ,,
Siddall, Mr. T. A. ..... ,,
Simon, Mr. John .....4 Eastgate Row
Simon, Mrs. ..... ,, .....
Simpson, Mr. Ricardo.....Elsinore, Curzon park
Sitwell, Mrs. ..... .....Eaton road

Sivertsen, Miss Inga ..... ..... 129 Canning street, Liverpool
Skipwith, Mr. Francis ..... ..... Old Bank House, Chester
Smith, Mr. T., J.P. ..... Blacon Point, Chester
Smith, Mr. Cecil P. .. ..... ,, ,,
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Smith, Mr. John ..... ..... Market Square
Smith, Miss ..... 25 Mount Pleasant, Saltney
Smith, Mr. R. J. ..... Aldford, Chester
Smith, Mr. T. ..... ..... 73 Bouverie street
Smith, Mr. W. ..... Glendale, Kilmorey park
Smith, Mrs. ..... ..... ,, ,,
Smith, Mr. S. G. ..... ,, ,,
Smyth, Miss Lyle .. ..... ..... Barrowmore Hall, near Chester
Sparling Rev. W., M.A. ..... Upton Vicarage, Chester
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Stockham, Mrs. ..... ,, ,,
*Stolterfoth, Dr., M A., J.P. .... 1 Grey friars
Stolterfoth, Mrs. ..... ,,
Stolterfoth, Miss ..... ..... ,,
Stonex, Rev. F. Tilney, M.A .. Abbot's grange, Liverpool road
Storr, Mr. F. ..... 21 The Groves
Storr, Miss..... ,,
Storrar, Miss Jessie ..... 4 Park street
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Storrar, Mrs. Jas. ..... ..... Newgate street House
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Sturge, Mr F. A. ..... Coed Efa, Wrexham
Sumner, Mrs. A. ..... South view, Eaton road
Swaine, Major-Gen., C.B., C.M.G... Government House

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Tasker, Mr. W. ..... Brook Field, Hoole road
Taylor, Mr. J., F.R.C.S., J.P. .. Haygarth House, 28 Nicholas street
Taylor, Mr. J. G., B.A. ..... ,, ,,
Taylor, Mr. J. Reginald ..... ,, ,,
Taylor, Miss ..... ..... ,, ,,
Taylor, Mr. John ..... ..... Hoole Hall Gardens
Taylor, Mr. A. G. ..... 6A Woodsome rd., Highgate rd., London, N.W.
Taylor, Mr. Hy., F.S.A. ..... 12 Curzon park
Taylor, Mr. F. Willis .... ..... 6 Curzon park
Taylor, Mrs. ..... ,,
Thomas, Mr. ..... 18 Pepper street
Thomas, Dr. E. J. Haynes ..... ,,
Thomas, Miss..... ,,
Thomas, Miss Constance..... ,,
Thomas, Miss F. M..... ,,
Thomas, Mr. Maurice ..... 41 Halkyn road, Hoole
Thomas, Mr. Felix ..... Churton road, Tarvin road
Thomas, Mr. E. H. ..... The Industrial Schools, Boughton
Thomas, Mr. W. C. ..... ..... 58 Northgate street
Thomas, Rev. R. A., M.A..... Diocesan Training College
Thompson, Mr. Hy. ..... ..... Brightholme, Curzon park
Thompson, Mrs. ..... ,, ,,
Thompson, Mr. Joseph ..... 24 South view, Sealand road
Thompson, Mr. A. H. ..... ,, ,,

Thomson, Miss I. .....Cambrian view
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Tomlin, Miss Lilian Ethel ..... ,, ,,
Tomlin, Miss Edith Clarabel .... ,, ,,
Townshend, Mr. C. W., J P. ....Trevallyn, Wrexham
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Trelawny, The Hon. Mrs. .....Shotwick park, Chester
Tushingham, Mr. T. .....44 Brook street

Vernon, Mr. W. .....57 Upper Northgate street
Vincent, Mr. J. A. .....34 King street
Vincent, Mr. W. F. ..... ,,

Wakefield, Mr. Robert.....Newton Hall Gardens
Wakefield, Mr. T. .....3 Lorne street (South)
Wakefield, Mrs. ..... ,, ,,
Wakefield, Miss A. E. ..... ,, ,,
*Walker, Mr. A. O., J.P., F.L.S... Ulcombe place, near Maidstone
Walker, Mrs. ..... ,, ,,
Walker, Miss .....23 Liverpool road
Walley, Mrs. .....Mountain view, Raymond street
Ward, Miss .....18 Eaton road
Warmsley, Mr. F. J. ..... 2 White friars
*Watts, Mr. C. T. F., B.Sc. ....The Grosvenor Museum
Way, Mr. N. A. E. .....1 Stanley street
Weaver, Mr. W. M. .....Westminster buildings
Weaver, Mr. Thos. .....Fern Cottage, Christleton
*Webster, Mr. G. Watmough, F.C.S...Brook lodge, Brook lane
Webster, Mr. Sirrell M. ..... ,, ,,
Webster, Miss Amy B. .....30 St. Martin's-in-the-fields
Webster, Mr. Geo. P. .....7 Crane street
Wedges, Mr. S. T. .....116 St. Anne street
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*Welsh, Mr. John, F.C.S. .....12A Seller street
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Westminster, Her Grace The Duchess of .... ,,
*Whichello, Mr. H., L.R.C.P., M.R.C.S...The Mount, Tattenhall, Chester
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Whiteley, Mr. F. .....Helsby, Warrington
Wigg, Mr. Charles .....Hoole bank, Chester
Wigg, Mr. Walter J. .....The Firs, Newton
Wilbraham, Miss E. .....5 King's buildings
Wilbraham, Miss F. ..... ,, ,,
Wilkinson, Mr. R. .....49 Cambrian view
Wilkinson, Miss Jane ..... ,, ,,
Williams, Mr. J. E. .....Westminster buildings
Williams, Mr. John .....Blue Bell bank, Saltney
Williams, Rev. J. R., M.A. ....Pulford Rectory, Wrexham
Williams, Miss .....72 Tarvin road
Williams, Mr. R. J. .....6 Eaton road
Williams, Miss Aldersey .....96 Watergate flags
Williams, Mr. James .....Egerton House, Hoole road
Williams, Mr. Lewis, M.B., C.M...Hoole
Wolfenden, Mr. A. .....7 Chichester street
Wolfenden, Miss Marion ..... ,, ,,

Wood, Miss .....28 Queen street
Wood, Mr. T. H. .....23 Grosvenor street
Wood, Mrs. A. ..... .....c/o Miss Tilston, 1 King's buildings
Woodfin, Miss .....26 Lorne street
Worcester, Miss .....c/o Messrs. Brown & Co., Eastgate row
Wright, Mr. A. J. .....11 Bridge street row
Wright, Mrs. ..... " "
*Wynne, Mr. Geo. F. .....Plas Gwyn, Minera, Wrexham
Wynne, Mr. J. H. .....41A Tarvin road
Wynne, Mrs. ..... "
Wynne, Mr. John.... .....Waverton, Chester

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Yerburgh, Mrs. ..... " " "

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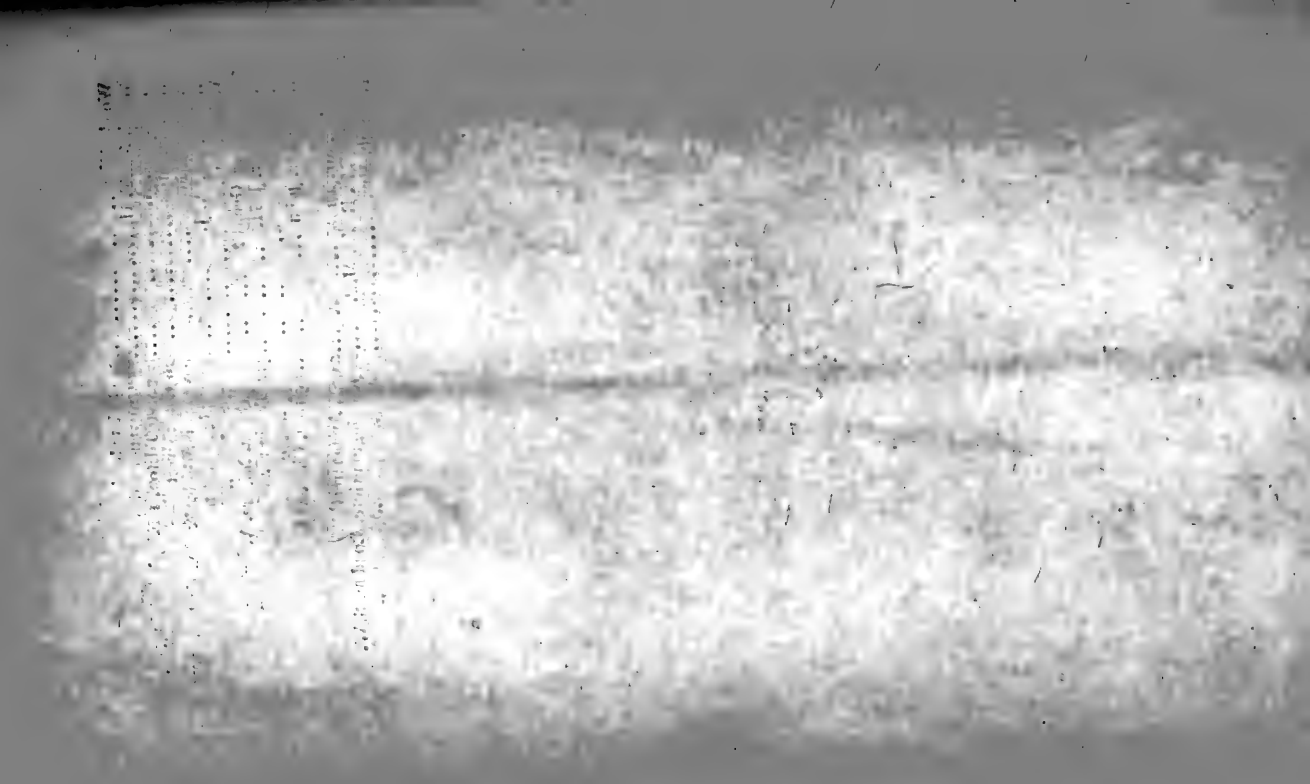

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of

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## Twenty-ninth Annual Report and Proceedings for the Year 1899-1900.

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OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY, 1871).

## TWENTY-NINTH

# ANNUAL REPORT

AND

# PROCEEDINGS.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art*," and that its objects be the promotion of the study of Natural Science, Literature, and Art by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Eight Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any Candidate for Membership of the Society, with those of a Proposer and a Seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

7.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each—except to the Annual General Meeting, to which Members only are admitted.

8.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription and all arrears.

9.—The names of Members whose Subscriptions are two years in arrear, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrear.

10.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

11.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

12.—That the Committee shall arrange General Field Meetings during the year. The place of meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

13.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

14.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies the election shall be by Ballot. The Officers' Reports and Financial Statement, made up to the end of April, and duly audited, shall also be submitted, and read if desired.

15.—Nominations for the Committee and Auditors shall be sent in writing to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

16.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

17.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

18.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1900-1901.

## President:

J. D. SIDDALL, Esq.

## Vice-Presidents:

Prof. T. McKENNY HUGHES, F.R.S.
A. O. WALKER, Esq., J.P., F.L.S.
W. M. DOBIE, Esq., M.D., J.P., F.R.A.S.
H. STOLTERFOTH, Esq., M.A., M.D., J.P.
T. SHEPHEARD, Esq., F.R.M.S.
G. R. GRIFFITH, Esq.

## Officers of Sections:

### BOTANICAL.

Chairman—Mr. J. D. SIDDALL ... ... ... 19, *Eaton Road.*
Secretary—Mr. A. E. GOODMAN ... ... ... *Oakdene, Tarvin Road.*

### ZOOLOGICAL.

Chairman—Dr. W. HENRY DOBIE ... ... ... 2, *Hunter Street.*
Secretary—Mr. W. F. J. SHEPHEARD, F.C.S.... *Bridge Street Row.*

### GEOLOGICAL.

Chairman—Mr. A. W. LUCAS, F.G.S.... ... ... 7, *Victoria Pathway, Queen's Park.*
Secretary—Mr. EGERTON GILBERT ... ... 17, *Eaton Road.*

### NATURAL PHILOSOPHY.

Chairman—Mr. G. WATMOUGH WEBSTER, F.C.S. *Brook Lodge, Brook Lane.*
Secretary—Mr. J. BAIRSTOW, F.C.S. ... ... *Burley, Queen's Park.*

### MICROSCOPICAL.

Chairman—Dr. STOLTERFOTH... ... ... ... 1, *Grey Friars.*
Secretary—Mr. J. D. SIDDALL... ... ... ... 19, *Eaton Road.*

### PHOTOGRAPHIC.

Chairman—Dr. STOLTERFOTH.. ... ... ... 1, *Grey Friars.*
Secretary—Mr. J. H. SPENCER ... ... ... 36, *Bridge Street.*

### LITERATURE.

Chairman—Rev. A. H. FISH, B.A., B.Sc. ... ... *Arnold House.*
Secretary—Mr. H. G. PHILLIPSON, B.A. ... ... *Parkgate Road.*

### ASTRONOMICAL.

Chairman—Dr. W. M. DOBIE ... ... ... ... *Northgate House.*
Secretary—Mr. F. W. LONGBOTTOM ... ... *Haslemere, Queen's Park.*

### ART.

Chairman—The Very Rev. Dr. DARBY ... ... *The Deanery.*
Secretary—Mr. WALTER SCHRÖDER, A.R.C.A. 30, *Eaton Road.*

## Hon. Treasurer:

Mr. JOHN SIMON, 4, *Eastgate Row.*

## Hon. Secretaries:

*Scientific*—Dr. STOLTERFOTH, M.A., 1, *Grey Friars.*

*General*—Mr. G. P. MILN, *Milnholme, Brook Lane.*
Mr. W. F. J. SHEPHEARD, F.C.S., *Bridge Street Row.*

## Hon. Librarian:

Mr. P. H. FLETCHER, *Woodbrae, Curzon Park.*

## Committee:

The above Officers *(Ex-Officio)*,

AND

Rev. J. L. BEDFORD, M.A., F.L.S.
Mr. J. DAY.
Mr. J. LYON DENSON.
Dr. HERBERT DOBIE.
Dr. GRANGER.
Dr. HAMILTON.
Mr. E. HODKINSON.
Dr. KING.
Mr. W. F. LOWE, A.R.S.M., F.I.C., F.C.S.
Mr. J. A. McMICHAEL, B.A., B.Sc.
Mr. W. SHONE, F.G.S.
Mr. W. W. SIDDALL.

## Hon. Auditors:

Mr. BERESFORD ADAMS. Mr. E. NOEL HUMPHREYS, C.A.

## Curator and Assistant-Librarian:

Mr. R. NEWSTEAD, F.E.S., *The Grosvenor Museum.*

## Assistant-Secretary:

Mr. H. NEW.

## Representatives of the Society upon the Grosvenor Museum Management Committee:

Rev. A. H. FISH, B.A., B.Sc.
Mr. J. D. SIDDALL.
Mr. G. P. MILN.
Mr. JOHN SIMON.
Mr. J. BAIRSTOW, F.C.S.
Mr. G. WATMOUGH WEBSTER, F.C.S.

## HON. SCIENTIFIC SECRETARY'S REPORT.

DURING the past year, under the able presidency of Mr. Siddall, the Society has enjoyed marked prosperity, and in a variety of ways justified its existence. The number of Members has increased, and the Society has now a small balance in its favour. This is due to the efficient management of your Committee.

Again, the purely scientific work has not been lacking, and it will be seen from the appended lists that the Lectures during the past winter have been of great value; not only the General Lectures, but also those given at the Sectional Meetings. This has been proved by the very large audiences that have come to hear them. Some of the subjects treated were of special interest at the present moment—being connected with South Africa, and our Society gladly devoted the proceeds arising from one of these lectures to help those who are now nobly devoting their lives to the restoration of peace, and making it possible that South Africa may yet become one of the brightest and happiest portions of Her Majesty's Empire.

The excursions during the last summer were well attended, and it is to be hoped that the knowledge of our own *Flora* and *Fauna* has become more widely spread. The notable event of the year was the discovery of the Human Skeleton in the Boulder-clay at Saltney, by Mr. Newstead. The full significance of this discovery yet remains to be appreciated. Some of our Members have given special attention to the *Flora*, and have added to our already published list.

The Natural Philosophy Section has had many good Meetings. The study of Physics is every year becoming more and more important; and what are to-day the experiments of the Laboratory, will shortly become necessities of modern civilization. Art has not been forgotten, and has taken a place amongst our Sections. Let us hope by cultivating our sense of beauty it will give us a keener appreciation of nature, and by improving design make labour less mechanical and, therefore, less irksome.

Although there has been much to cheer us, still the past year has been to many of us a year of sorrow. First, the loss of our good Duke, who by his kindness and generosity has always helped forward everything that would conduce to the moral and intellectual advancement of Chester. Again, we have lost Alderman Charles Brown, who was a loyal friend to the Society from its very foundation. In conclusion, your Committee appeal most earnestly to all the Members to try and work out some one point in Natural Science, however humble and obscure it may seem; they themselves will be the better for the study, and the story of Newton and the apple, and of Galvani and the frogs, prove that simple observations may lead to great results.

HENRY STOLTERFOTH,
*Scientific Secretary.*

## HON. SECRETARIES' REPORT.

In presenting the 29th Annual Report, your Committee have pleasure in congratulating you on the success of the Society during the past year.

The total membership is not only higher than at any previous period, but there has of late been increased enthusiasm amongst the Members, with the result that the attendance at both the General and Sectional Meetings has been above the average.

The total number of Members at present on the Society's books is as follows:—

| | |
|---|---|
| Honorary Members - - - | 29 |
| Corresponding Members - - - | 18 |
| Ordinary Members - - - - | 822 |
| Total - - - | 869 |

being an increase of 61 over last year.

Your Committee have met fifteen times during the year for the transaction of the Society's business, and all these meetings have been well attended by the Members and Sectional Officers, who have shown a keen interest in the work of the Society.

There were seven Excursions held during the Session, as follows:—

| | |
|---|---|
| Overton-on-Dee | June 13th |
| Gwydyr Castle, Llanrwst (Annual Excursion) | June 28th |
| Oakmere, Delamere | July 7th |
| Rhydymwyn and Hendre | July 12th |
| Burton Point (Cyclists' Excursion) | July 18th |
| Old Parsonage Gardens, Gresford | September 6th |
| Botanical Gardens, Liverpool | September 20th |

In addition there were six Evening Field Meetings held.

The Conversazione also proved to be a very popular and a very pleasant gathering of Members and their friends. Although there was no special outside attraction provided—the exhibits being worked entirely by our own Members—the attendance was quite up to the average.

The Members of the Handbridge Men's Club, accompanied by their friends (altogether about 200), were invited by the President and Committee to a "Museum Evening." After an Illustrated Lecture in the Theatre, they were conducted through the Museums, and given light refreshment before leaving. The Committee afterwards received a very hearty vote of thanks from them.

With regard to the Winter Session, we think we may fairly claim that this has been one of the most successful

we have ever had. There were altogether nine General Meetings, and also nineteen Sectional Meetings, as follows:—

## GENERAL MEETINGS.

1899.

Oct. 20th—Annual Conversazione.

,, 26th—"Human Remains from the Local Boulder-Clay"—
MR. R. NEWSTEAD, F.E.S.

Nov. 2nd—"The Transvaal or South African Republic"—
ROBERT WALLACE, ESQ., F.R.S.E., F.L.S., &c.

Dec. 6th—"The Transvaal and the War"—MR. J. D. SIDDALL.

,, 7th—"Modern Eye Troubles"—
F. M. GRANGER, ESQ., M.R.C.S., L.R.C.P.

1900.

Jan. 4th—"Artificial Cross-Fertilization of Cereals and Grasses"—
MR. G. P. MILN.

Feb. 8th—"Light and Colour": Illustrated by Experiments and Demonstrations with the Electric Lantern—
REV. A. H. FISH, B.A., B.Sc.

March 1st—A Demonstration Lecture on "Edison's Grand Concert Phonograph," by MR. PARMITER (Manchester).

,, 8th—"A Summer Holiday in the Lleyn Peninsula"—
THE PRESIDENT (MR. J. D. SIDDALL).

April 5th—"Out and about Killarney"—MR. J. H. SPENCER.

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## SECTIONAL MEETINGS.

### BOTANICAL.

1900.

Jan. 25th—"The Photography of Minute Botanical Objects," by
MR. A. E. GOODMAN.

April 26th—Exhibition of Spring Flowers—
MEMBERS OF THE CHESTER PAXTON SOCIETY.

### ZOOLOGICAL.

1900.

Feb. 1st—"Ornithological Notes of the past year," by DR. W. H. DOBIE.
"Entomological Notes on last year's experience at the Electric Lights," by DR. HERBERT DOBIE.
"Cheese-Hoppers"; "Currant-bud Mites"; "Slug-Worms"; and a "Caterpillar Parasite," by MR. R. NEWSTEAD, F.E.S.

April 12th—"Our British Birds"; A Resumé—Mr. R. NEWSTEAD, F.E.S.

### GEOLOGICAL.

1899.

Nov. 9th—"An Evening with the Rocks and Fossils of our District": Laurentian, Cambrian, Silurian, and Devonian Formations, by MR. A. W. LUCAS, F.G.S., & MR. EGERTON GILBERT.

1900.

Feb. 15th and April 19th—"Carboniferous System of Rocks"; including the Millstone Grit, the Mountain Limestone, and Coal, by
MR. A. W. LUCAS, F.G.S., & MR. EGERTON GILBERT.

## NATURAL PHILOSOPHY.

1899.

Nov. 16th—"The Modern Manufacture of Iron and Steel," by
MR. J. KENT SMITH.

1900.

Feb. 22nd—"Micro-Organisms: Our secret friends and foes," by
MR. JOHN WELSH, F.C.S., Ph.Ch.

## MICROSCOPICAL.

1899.

Nov. 23rd—Practical Microscopical Evening—
"The use of Parti-coloured Diaphragms"—
DR. STOLTERFOTH.
"How to collect, prepare, and show Living Objects"—
MR. M. JOHNSON, L.D.S.I.
"How to Photograph Micro-objects"—
MR. A. E. GOODMAN.
"The Electric Projection Microscope"—
MR. J. D. SIDDALL.

## PHOTOGRAPHIC.

1899.

Nov. 30th—"Photography for Beginners"—Demonstrations by
MEMBERS OF THE SECTION.

1900.

March 15th—Exhibition of Lantern Slides, by MEMBERS OF THE SECTION.

## LITERATURE.

1899.

Dec. 14th—Paper on "Shakespeare's Play, 'As you like it'"—
MR. STANLEY WOOD.

1900.

March 22nd—Paper on "English Dress in the time of Shakespeare"—
MR. A. POTTS, M.A.

## ASTRONOMICAL.

1900.

Jan. 11th—Some recent Astronomy—
"Sun and Planets"—DR. WHICHELLO.
"Moon"—DR. DOBIE.
"Stars and Nebulæ"—MR. F. W. LONGBOTTOM.

## ART.

1899.

Oct. 20th to Nov. 24th—Exhibition of Pictures—Oil and Water Colour.

1900.

Jan. 6th—Social Evening—Subject for discussion "Colour Printing."

,, 18th—"The History of a Chair," by MR. W. SCHRÖDER, A.R.C.A.

February—Exhibition of Decorative Art.

March 29th—"Embroidery—Ecclesiastical and Domestic," by
MR. ROB HILTON.

G. P. MILN,
W. F. J. SHEPHEARD, | *Hon. Gen. Secretaries.*

MAY 3RD, 1900.

# The Hon. Treasurer in account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1900.

| Dr. 1899-1900. | £ s. d. | £ s. d. |
|---|---|---|
| By Balance from last Year .. .. .. | | 1 4 4 |
| ,, 738 Subscriptions for 1899-1900 @ 5/- .. | 184 10 0 | |
| ,, 18 ,, Arrears 1898-99 @ 5/- .. | 4 10 0 | |
| ,, 1 ,, ,, 1897-98 @ 5/- .. | 0 5 0 | |
| | | 189 5 0 |
| ,, Gross Receipts from Excursions— | | |
| To Overton-on-Dee .. .. .. | 5 8 0 | |
| ,, Gwydyr Castle .. .. .. | 16 5 6 | |
| ,, Rhydymwyn .. .. .. | 2 9 6 | |
| ,, Dr. Mules' Garden, Gresford .. | 0 19 0 | |
| ,, Liverpool .. .. .. .. | 1 0 6 | |
| | | 26 2 6 |
| ,, Gross Receipts from Evening Meetings, &c.— | | |
| ,, Annual Conversazione .. .. .. | 12 0 0 | |
| ,, Lecture by Professor Wallace .. .. | 0 18 0 | |
| ,, ,, Rev. A. H. Fish .. .. | 0 5 0 | |
| ,, ,, Mr. Siddall .. .. .. | 0 14 0 | |
| ,, ,, Mr. Spencer .. .. .. | 2 0 6 | |
| | | 15 17 6 |
| ,, Special Lecture by the President— "The Transvaal and the War" .. .. .. | | 13 14 0 |
| | | £246 3 4 |

| Cr. 1899-1900. | £ s. d. | £ s. d. |
|---|---|---|
| To Museum Management Committee— | | |
| Proportion of cost of Maintenance | 60 0 0 | |
| Lantern Account .. .. .. | 10 10 0 | |
| | | 70 10 0 |
| ,, Natural History Museum and Library .. .. | | 19 19 6 |
| ,, Printing, Advertising, and Stationery .. .. | | 38 14 5 |
| ,, Expenses in connection with Excursions— | | |
| Overton-on-Dee .. .. .. | 4 11 0 | |
| Gwydyr Castle .. .. .. | 14 9 0 | |
| Rhydymwyn .. .. .. | 2 7 6 | |
| Dr. Mules' Garden, Gresford .. | 0 15 0 | |
| Liverpool .. .. .. .. | 0 17 6 | |
| | | 23 0 0 |
| ,, Expenses in connection with Evening Meetings— | | |
| Conversazione .. .. .. | 15 9 7 | |
| Mr. Parmiter's Lecture .. .. | 1 1 6 | |
| Rev. A. H. Fish's Lecture .. | 1 16 7 | |
| | | 18 7 8 |
| ,, The President's Transvaal Lecture— | | |
| Nett proceeds handed to General Swaine for "Soldiers' Relief Fund" .. .. .. | | 13 14 0 |
| ,, Postages .. .. .. .. .. .. | | 20 3 3 |
| ,, Salaries— | | |
| Assistant Secretary .. .. .. | 10 0 0 | |
| Management Committee for Mr. Newstead's Apprentice .. | 5 0 0 | |
| H. Hall for Collecting Subscriptions | 1 2 6 | |
| | | 16 2 6 |
| ,, Subscriptions— | | |
| Palæontographical Society .. | 1 1 0 | |
| Entomological Society .. .. | 1 1 0 | |
| | | 2 2 0 |
| Balance in hand .. .. .. | | 23 10 0 |
| | | £246 3 4 |

Examined with the Accounts and Vouchers relating thereto, and found to be correct, shewing a balance of £23 10/- in the hands of the Hon. Treasurer (in Lloyds' Bank, Limited).

BERESFORD ADAMS, } Hon. Auditors.

# "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Account for the Year ended 30th April, 1900. **Cr.**

| 1899-1900. | £ | s. | d. | 1899-1900. | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| To Balance from last Account | 3 | 16 | 1 | By Prizes awarded as follows:— | | | |
| ,, Dividends on Great Western Railway Company Consolidated Ordinary Stock | 15 | 19 | 0 | Miss Payne | 1 | 11 | 6 |
| | | | | ,, A. Payne | 1 | 11 | 6 |
| | | | | ,, Cummings | 1 | 1 | 0 |
| | | | | ,, G. M. Siddall | 1 | 1 | 0 |
| | | | | Mrs. Jones, Bala | 1 | 1 | 0 |
| | | | | Dr. Herbert Dobie | 3 | 3 | 0 |
| | | | | Mr. J. Thompson | 3 | 3 | 0 |
| | | | | ,, Interest and Commission charged by Bank | 0 | 1 | 7 |
| | | | | Balance | 7 | 1 | 6 |
| | £19 | 15 | 1 | | £19 | 15 | 1 |

To Balance in Bank..... £7 1 6

Examined and found correct,

(*Signed*) G. P. MILN, HON. TREASURER.

(*Signed*) JOHN DAVIES, HON. AUDITOR.

## KINGSLEY MEMORIAL PRIZES

ARE OFFERED AS FOLLOWS:—

**To any Resident in the Society's District.**—A PRIZE not exceeding TEN POUNDS for the best COLLECTION OF OBJECTS, OR ESSAYS, OR NOTES OF OBSERVATIONS, OR PHOTOGRAPHS illustrating the Natural Science of the Society's District. The amount given will be proportionate to the *quality* of the Collection.

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the persons competing.

*The Collections, Essays, or Notes must be sent in to either of the General Secretaries on or before 1st September, and the awards will be made at the Conversazione next succeeding the adjudication.*

**NOTE.—The Committee have the option of retaining the successful Collections, &c., or any part of them, for the Society.**

Intending Competitors can obtain all particulars, and the conditions under which the Prizes are offered, from either of the General Secretaries; and all Collections, &c., must be sent in to either of them on or before the 1st September in each year.

# CURATOR'S REPORT.

THE decided increase in the number of donations to the Society's Natural History Collections during the past year is highly satisfactory. SURGEON-COL. ARCHER'S generous gift of the collection of Land, Freshwater, and Marine Shells is a most valuable one. It embraces nearly all the known British species, including many that are rare; also extensive series of the majority of species, but more especially so of the variable species of the Genus *Helix*. As the nomenclature and the classification of the *Mollusca* has considerably changed since the collection was last arranged, it will need careful revision and reclassification. The collection was chiefly made by COL. ARCHER'S late brother, MR. F. ARCHER, of Liverpool, who, as an accomplished Naturalist and Archæologist, was well known to many of the leading Scientists of this Society. He showed the keenest possible interest in the welfare of our Museum, and at its commencement made many valuable suggestions to your Curator with reference to the formation and preparation of various collections; the valued gift is, therefore, a pleasant tribute to his memory.

Of the Kingsley Memorial Prize Collections, DR. HERBERT DOBIE'S collection of *Lepidoptera* taken at the electric lamps has added many species new to our collection, which are of interest, either for their rarity or for the long distances which many of them had apparently been attracted from their native habitats. MR. J. ARKLE and MR. GEO. O. DAY have also contributed several rare *Lepidopterous* Insects, and your Curator takes this opportunity of expressing his indebtedness to them; as also to DR. HERBERT DOBIE for the unfailing interest he has continuously shown in bringing together a representative collection of the *Lepidopterous Fauna* of the Society's district. MR. E. W. W. BOWELL'S gift of *Lepidoptera* is a most extensive one; but in the absence, at the present moment, of data to certain species, your Curator withholds further comment.

The acquisition of the Human Skeleton from the boulder-clay at Saltney, together with the objects found associated with it, is of great scientific interest; and our best thanks are due to MR. MORTON BROWNE, both for his generous gift of the skeleton and for the courtesy he at all times extended to your Curator in allowing him to thoroughly investigate the scene of the discovery.

MR, R. J. SMITH has rendered valuable assistance in procuring materials for certain Biological research work, for which, and also for his willingness at all times to procure both specimens and material, your Curator tenders sincere thanks.

MESSRS. CHAS. OLDHAM and T. A. COWARD have helped us in many ways, and have promised their further support in procuring Zoological specimens.

THE PRESIDENT (Mr J. D. SIDDALL), THE SECRETARY (MR. W. F. J. SHEPHEARD), DR. STOLTERFOTH, and MR. SPENCER have rendered much assistance in the preparation of Lectures and Museum work by the loan of special Photographic apparatus.

The following miscellaneous gifts have also been made :—

Photographs of Insects, by Dr. Stolterfoth ;

Photograph of restored drawing of *Sphenopteris teliana*, by the late Mr. G. H. Morton, F.G.S. ;

Two gross small Glass-topped Boxes, by Mr. Chas. Oldham.

In conclusion, your Curator begs most respectfully to offer his sincere thanks to the Committee and Members of the Society for the kind sympathetic support he has at all times received at their hands.

A list of Donors is appended.

ROBT. NEWSTEAD, F.E.S.,

APRIL, 1900. *Curator.*

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THE additions to the Natural History Museum are as follows :—

| ABSTRACT OF THE REPORT. | Species Presented and Purchased | Total of Specimens |
|---|---|---|
| Geology .. .. .. .. .. .. .. .. | 39 | 121 |
| *Echinodermata* .. .. .. .. .. .. | 1 | 1 |
| *Crustacea* (Shrimps, &c.) .. .. .. .. .. | 1 | 1 |
| *Acari* (Mites) .. .. .. .. .. .. .. | 1 | 1 |
| *Hemiptera—Homoptera* (Frog-hoppers) .. .. .. | 6 | 8 |
| *Diptera* (Two-winged Flies) .. .. .. .. .. | 2 | 2 |
| *Lepidoptera* (Moths and Butterflies) .. .. .. .. | 548 | 1,293 |
| *Coleoptera* (Beetles) .. .. .. .. .. .. | 17 | 20 |
| *Hymenoptera* (Bees and Wasps) .. .. .. .. | 15 | 145 |
| *Conchology* (Shells) .. .. .. .. .. .. | 675 | 7,988 |
| *Pisces* (Fish) .. .. .. .. .. .. .. | 3 | 3 |
| *Reptilia* (Snakes, &c.) .. .. .. .. .. | 5 | 6 |
| Nests and Eggs.. .. .. .. .. .. .. | 12 | 15 |
| *Aves* (Birds) .. .. .. .. .. .. .. | 14 | 15 |
| *Mammalia* (Animals) .. .. .. .. .. .. | 14 | 15 |
| Miscellaneous .. .. .. .. .. .. .. | — | 176 |
| Total .. .. .. .. | 1,353 | 9,810 |

# LIST OF DONORS AND ADDITIONS TO THE MUSEUM.

| | *Geology.* | | *Echinodermata* (Starfish, &c.) | | *Crustacea* (Shrimps, &c.) | | *Acari* (Mites). | | *Hemiptera—Homoptera* (Frog-hoppers). | | *Diptera* (Two-winged Flies) | | *Lepidoptera* (Moths & Butterflies) | | *Coleoptera* (Beetles). | | *Hymenoptera* (Bees & Wasps). | | *Conchology* (Shells). | | *Pisces* (Fish). | | *Reptilia* (Snakes, &c.) | | Nests and Eggs. | | *Aves* (Birds). | | *Mammalia* (Animals). | | Miscellaneous. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. | Species. | Specimens. |
| Col. T. Archer ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 669 | 7967 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. Arkle ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 13 | 39 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. Coutts Antrobus | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 3 | ... | ... | ... | ... |
| Mr. Bairstow ... | 1 | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. Beasley ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. E. W. W. Bowell ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 427 | 1050 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. Morton Browne ... | 16 | 80 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. Clarke ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Col. B. G. Davies-Cooke | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. T. A. Coward ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... |
| Mr. Geo. O. Day ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 13 | 38 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Dr. Herbert Dobie ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 3 | ... | ... | 39 | 131 | 1 | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. H. R. Douglas ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. George Dutton ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. George Frater ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 3 | ... | ... | 47 | 108 | 7 | 9 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. Gaulton ... | 1 | 12 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Captain E. W. Griffith | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... |
| Mr. John Guy ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. T. H. Hignett ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... |

| | | |

# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1899.

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

The results here given are deduced from bi-daily observations of the standard instruments taken at 9-0 a.m. and 9-0 p.m. local mean time. Returns are sent to the Royal Meteorological Society, the Meteorological Council, the Scottish Meteorological Society, and many private observers in different parts of the Empire.

January.—A very mild month, exceedingly wet, with southerly and westerly winds until the 23rd. The last nine days being much colder and dry, with a great deal of fogginess all round, but much clearer overhead. Gale on 2nd from N.W. and on 8th from W. The mean temperature of the month was 3·3 degs. above the average, and the rainfall 250 per cent. above the average. Rain fell on 23 days.

February.—A very normal month, fully one degree above the average temperature due to the greater heat during the day. Remarkably sunny; only four days without any bright sunshine. Wind nearly reached the force of a gale on the 10th from the S.S.W. Prevailing wind from S.W. up to 11th, afterwards from S.-Easterly. First 18 days wet. Snow on 4th. Fog on 3rd and 4th and 28th. Thunderstorm on 14th. Great preponderance of bright sunshine on afternoons.

March.—A rather dry and magnificently sunny month, with severe cold snap during first week and from 18th to 25th. Windy during the last week, rising to a gale from the S.W. on the 28th. The high shade temperature of 67·0 was reached on the 16th. Rain, both as to amount and number of days, slightly below the average. Frost in shade four feet above ground 13 nights, and on ground in the open air on 21 nights. Snow fell on 20th—two inches deep—lay for five days. Fog on 1st, 5th, 16th, and 31st. Hoar frost on three days. Solar corona on 25th. 17½ hours more sunshine in the afternoons than the forenoons.

April.—A rather warm but dull and wet month, only three consecutive days without rain. Amount of excess 1½ inches. Hail on 9th. Gale on 7th and 8th from N.W. Only one night's frost in shade and four on ground. Although the highest shade temperature was only 61·6 degs., it was uniformly high, making the monthly mean about a degree above the average. Slight hoar frost on 17th. Ozone on 25th, very marked with gentle N.W. wind. Forenoons sunnier than the afternoons.

May.—A dull, rather cold, wet, and sunless month. 1½ degs. below the average, and with prevailing easterly winds, and ¾-of-an-inch above the average rainfall. From the 9th to the 23rd very cheerless weather prevailed. A thunderstorm on the afternoon of the 9th, and thunder heard on 15th. From 8th to 12th very hazy, almost amounting to fog in the mornings. The last four days were dry, sunny, clear, and warm, with northerly winds very light. Frost in shade on three nights, and on the ground five nights.

June.—A decidedly warm, dry, and sunny month. No rain until the 18th. On the five days—18th to 20th, 28th, and 30th, over 2·6 inches fell. Very clear skies and bright sunshine with beautifully warm days, although hazy in the forenoon until the rain began. 80·8 degs. highest shade temperature on the 17th. Thunder on 21st. A gale on the 24th from the N.W.

An absolute drought from 24th May terminated on the 17th June. 3½ weeks glowing sunshine without a drop of rain.

July.—A warm month. Highest temperature 81·8 on 31st, accompanied with fog. High night temperatures throughout, only three below 50 degs., the average being 54·4 degs. Deficient in bright sunshine throughout, and having two days, 21st and 22nd, without any. Rainfall below average. Eleven rainy days pretty equally distributed. The first and last week were windy with a moderate gale from W.N.W. On the 3rd pressure high. Thunder heard on the 17th. Thunderstorm on 20th.

AUGUST.—A very warm month, dry and calm of a S.Easterly type, 5·0 degrs. above the average—principally due to the high day temperatures throughout—being 7·2 degrs. above the average, 8 days being above 80·0 degrs. The highest shade temperature of the year 85·8 degrs. was on the 24th as well as the sunniest day, having 90·0 per cent. of the greatest possible amount on the 8th. Rainfall deficient to the extent of an inch. Two partial droughts of 8 days each. Thunder storms on 4th and 5th. Fog on the 1st and 2nd.

SEPTEMBER.—A wet month, of average temperature, with this peculiarity: that the night temperatures were just as much above the average as the day temperatures were below it—1·1° in each case. The month opened with a week of quite warm westerly weather, and closed with fully a week of cold boisterous wet north-westerly weather. Thunder heard on the 2nd, and thunder storm, accompanied with hail, on the 27th. Moderate gale from the N.N.W. on the 27th. Eighteen consecutively wet days from the 12th. Rain fell on 22 days—$\frac{1}{2}$ an inch above the average.

OCTOBER.—Opened with a heavy downpour of rain, and fresh breeze from S.S.W.; and contained two partial droughts of eight and ten consecutive days respectively, and closed—excepting the 31st—with seven wet days, fully $\frac{3}{4}$ of an inch falling on the 29th. Temperature a little above average on account of high day temperature. Pretty equal throughout, and sunny. Frost in shade two nights, on ground six nights. Fog on 8th, 20th, and 21st.

NOVEMBER.—A *very* warm month, 5·6° above the average, the high night temperature being principally accountable for this. Only two days without rain up to and including the 11th, and only two days with rain after it. A partial drought of 10 days closed the month. Gales from the W. on the 10th and 11th, and generally windy up to these days, and exceptionally light north-westerly winds to the end of the month. Frost in shade two nights, on ground three nights. Fog on 18th, 19th, and 21st. Lightning seen in N.W. on 7th.

DECEMBER.—A very gloomy, calm, and cold month, $2\frac{1}{2}$ degs. below the average. Remarkable calmness, with the exceptionally low pressure of 28·380 inches. Very dull, with 19 days without any bright sunshine, and 17 days overcast. First snow of the season fell on night of the 11th—4 inches deep, and lay until the 18th. Fog on 5th and 7th, 23rd and 27th. Frost in shade 13 nights, on ground 23 nights. Hoar-frost on 6 nights. Hail fell on 25th. The shade temperature fell to 12·6° on the 14th. The sudden fall of 8·0° *more than the normal* from the temperature of November is quite unprecedented.

As the tables give the Meteorological elements for the year 1899 only, it is desirable to add a comparison of the winter and spring months of the present year in brief.

SHADE TEMPERATURE AND DIFFERENCE FROM AVERAGE.

| **Winter of 1898-9.** | | **Spring of 1899.** | |
|---|---|---|---|
| December .. .. | 31·3°—2·4° | March .. .. | 38·9°—3·3° |
| January .. .. | 40·9°+3·3° | April .. .. | 47·9°—1·1° |
| February .. .. | 35·8 — 4·2° | May .. .. | 51·4°—1·0° |
| Mean .. .. | 37·6 — 1·1° | Mean .. .. | 46.0 —1·8° |

THE WINTER MONTHS.—*December* was about $2\frac{1}{2}$ degrees below the average temperature, *January* $3\frac{1}{3}$ degrees above it, and *February* $4\frac{1}{4}$ degrees below it. This sudden drop during the first half of February being accompanied by snow and very severe frosts, and followed by a rainy period and cold easterly winds, made a long, trying, bleak winter, and as there were 48 days without any bright sunshine, and a very large amount of cloud, it was gloomy and sunless.

THE SPRING MONTHS.—*March* was $3\frac{1}{3}$ degrees below the average, had 8 sunless days, 15 days frost on ground, and cutting northerly and easterly winds prevailed. It was dry and dusty. Coming after such a winter, and having a temperature lower than a normal February, it was the most trying Spring month on record, and threw vegetation very far back. *April* and *May*

were each fully one degree below the average temperature, and as there were 12 days frost on ground in April, and 5 sunless days in May, and a prevalence of cold easterly winds, it is not surprising to learn that it is one of the most backward Springs on record, so far as vegetation is concerned, and an exceedingly trying one for invalids and old people.

## NOTEWORTHY PHENOMENA OF 1899.

Greatest atmospheric pressure ..... 30·758, 26th January
Least ,, ,, ..... 28·380, 26th December
Hottest day in shade ..... 85·8 degs., 24th August
Coldest night in shade ..... 12·6 degs., 14th December
Greatest range of temperature in 24 hours .. 36·6 degs., 16th March
Least ,, ,, ,, ,, .. 2·5 degs., 27th October
Hottest day in sun ..... 124·6 degs., 6th July
Coldest night on ground..... 6·7 degs., 14th December
Greatest excess of open air temperature over shade temperature, 52·4 degs., 19th June.
Greatest difference between lowest temperature in shade and on ground, 19·5 degs., 28th May.
Greatest rainfall on any one day, 0·780 in., 1st and 29th October.
Greatest number of consecutive days on which rain fell 18—13th to 30th September.
Greatest number of consecutive days on which no rain fell 17—1st to 17th June.
Sunniest day of the year, 11¾ hours, 18th August, being 90 per cent. of the total possible.
Welsh Hills at 9 a.m.—These were only visible on 115 days, or barely one-third of the year. There were only 14 days in the months of January, February, March, and December, on which they could be seen, and on only one day in March.

## EXPLANATIONS.

*The Barometer* readings, taken at 9-0 a.m. and 9-0 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9-0 a.m., and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9-0 a.m. and placed to previous day.

*Ground Temperatures* read twice daily at 9-0 a.m. and 9-0 p.m. The lowest reading for the 24 hours, prior to 9-0 a m., is entered to the previous day.

*Underground Temperatures* taken daily at 9-0 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew Point (as determined by Glaisher's Factors), by that corresponding to the temperature of the air (*i.e.* the Dry-bulb reading).

*The Rain* is measured at 9-0 a.m., and the amount entered to the previous day. A fall of 0·006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9-0 a.m. and 9-0 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8·0 an overcast day.

The *wind* direction is taken by means of a Compass Nephoscope, from the drift of the lower clouds.

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Ozone* read at 9-0 a.m. (according to Dr. Moffat's Scale 0—12), and placed to previous day.

*Sunshine Record.*—The photographic traces are fixed *before* being measured.

*Fog, &c.*—The fog, haze, &c., are made from the visibility of objects and lights at definite distances from Rutland Cottage.

*Local Mean Time* is used for the regular observations.

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | Bright Sunshine. Hours ending Local Apparent Time of each Day of the Month. Forenoon. 6 | 7 | 8 | 9 | 10 | 11 | Noon |
|---|---|---|---|---|---|---|---|
| Jan. ... | | | | ·50 | 3·48 | 7·66 | 10·82 |
| Feb. ... | | | ·25 | 4·99 | 7·94 | 12·06 | 12·73 |
| March.. | | 1·41 | 8·99 | 13·75 | 16·32 | 18·91 | 20·49 |
| April... | | 1·50 | 12·58 | 13·99 | 14·41 | 13·38 | 13·11 |
| May ... | 3·50 | 9·94 | 13·74 | 14·15 | 15·59 | 15·25 | 16·06 |
| June ... | 11·49 | 14·00 | 15·99 | 18·52 | 19·22 | 21·07 | 21·67 |
| July .. | 2·58 | 10·21 | 13·00 | 13·01 | 14·59 | 15·16 | 19·34 |
| Aug. ... | | 4·49 | 19·90 | 19·16 | 19·74 | 20·57 | 20·82 |
| Sept.... | | ·25 | 1·24 | 15·05 | 14·90 | 14·45 | 14·82 |
| Oct. ... | | | 4·24 | 15·42 | 18·91 | 19·75 | 20·83 |
| Nov. ... | | | | 1·91 | 5·65 | 9·34 | 13·31 |
| Dec. ... | | | | | ·25 | 2·91 | 2·92 |
| | 17·57 | 41·80 | 99·93 | 130·45 | 150·00 | 170·51 | 186·92 |

During Forenoon 798·18.

| Bright Sunshine. Hours ending Local Apparent Time of each Day of the Month. Afternoon. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Monthly. Total Hours. | Greatest possible Percentage. | No. of days without. | Seasons. Hours and Percentage. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12·58 | 9·34 | 3·25 | | | | | | 47·63 | 19·4 | 14 | Winter 153·99 20·7% |
| 14·75 | 14·16 | 11·76 | 9·32 | ·50 | | | | 88·46 | 32·7 | 5 | |
| 23·97 | 22·75 | 21·15 | 18·00 | 10·66 | ·83 | | | 178·23 | 49·0 | — | |
| 10·26 | 11·17 | 10·26 | 12·25 | 12·66 | 7·83 | 1·25 | | 134·65 | 32·4 | 5 | Spring 502·36 39·8% |
| 16·66 | 17·59 | 16·21 | 15·91 | 13·42 | 13·63 | 7·33 | ·50 | 189·48 | 39·0 | 6 | |
| 20·92 | 20·09 | 19·99 | 19·92 | 20·25 | 16·50 | 12·33 | 2·00 | 253·96 | 50·9 | 4 | |
| 14·41 | 16·83 | 20·07 | 18·49 | 16·74 | 19·08 | 12·66 | 1·33 | 207·50 | 41·5 | 2 | Summer 683·29 47·2% |
| 20·49 | 22·33 | 21·33 | 19·58 | 17·33 | 12·84 | 3·25 | | 221·83 | 49·3 | — | |
| 14·81 | 14·33 | 12·68 | 13·55 | 9·65 | 6·92 | ·25 | | 142·90 | 39·0 | 2 | |
| 19·25 | 19·49 | 18·84 | 16·58 | 5·50 | | | | 158·81 | 49·3 | 4 | Autumn 369·79 38·9% |
| 13·74 | 11·74 | 9·40 | 2·99 | | | | | 68·08 | 27·0 | 6 | |
| 4·06 | 4·75 | 2·91 | | | | | | 17·90 | 7·8 | 19 | |
| 186·00 | 184·57 | 167·83 | 146·59 | 107·71 | 77·63 | 37·01 | 3·83 | 1709·41 | 38·8 | 67 | |

During Afternoon 911·23.

| CLOUD (1·10). 9 a.m. | 9 p.m. | Daily Mean. | No. of days Overcast. | No. of days Clear. |
|---|---|---|---|---|
| 7·3 | 7·0 | 7·1 | 16 | 2 |
| 7·0 | 5·4 | 6·2 | 13 | 7 |
| 6·4 | 4·1 | 5·3 | 7 | 5 |
| 7·2 | 6·0 | 6·6 | 14 | 4 |
| 6·9 | 5·5 | 6·2 | 14 | 7 |
| 4·7 | 4·4 | 4·5 | 7 | 10 |
| 7·3 | 5·4 | 6·4 | 8 | 1 |
| 5·8 | 5·3 | 5·5 | 8 | 3 |
| 7·3 | 4·8 | 6·1 | 7 | 1 |
| 7·7 | 5·3 | 6·5 | 7 | — |
| 7·8 | 7·4 | 7·6 | 16 | 2 |
| 8·2 | 8·4 | 8·3 | 17 | — |
| 7·0 | 5·7 | 6·35 | 134 | 42 |

# METEOROLOGICAL OBSERVATIONS

## RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N.; Long. 11m. 36s. W.

| | MONTHLY SUMMARY | | | |
|---|---|---|---|---|
| | JAN. | FEB. | MARCH. | APR |
| PRESSURE (reduced to 32°F., and mean sea level)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 29·772in. | 29·846in. | 30·065in. | 29· |
| Highest reading | 30·758in. | 30·654in. | 30·689in. | 30· |
| ,, ,, Date of | 26 | 28 | 1 | 2 |
| Lowest ,, | 28·860in. | 28·990in. | 29·002in. | 28· |
| ,, ,, Date of | 2 | 11 | 8 | 1 |
| Range | 1·898in. | 1·664in. | 1·687in. | 1· |
| TEMPERATURE in shade (Stevenson's screen)— | | | | |
| Approximate mean | 41·0° | 41·1° | 42·4° | 47 |
| Mean maximum | 45·8° | 47·5° | 51·2° | 53 |
| Mean minimum | 35·9° | 34·7° | 34·5° | 41 |
| Extreme maximum | 56·6° | 58·8° | 67·0° | 61 |
| ,, ,, Date of | 4 | 10 | 16 | |
| ,, minimum | 20·7° | 21·9° | 22·1° | 29 |
| ,, ,, Date of | 28 | 4 | 24 | 1 |
| ,, Range | 35·9° | 36·9° | 44·9° | 31 |
| Mean daily range | 9·9° | 12·8° | 16·7° | 12 |
| Maximum daily range | 18·4° | 28·8° | 36·6° | 23 |
| ,, ,, Date of | 18 | 28 | 16 | 1 |
| Minimum ,, | 3·2° | 3·1° | 9·5° | 6 |
| ,, ,, Date of | 13 | 6 | 30 | 14 |
| Number of nights at or below 32° | 7 | 9 | 13 | |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 62·3° | 71·5° | 87·9° | 94 |
| Extreme maximum | 79·0° | 85·4° | 103·0° | 110 |
| ,, ,, Date of | 4 | 19 | 30 | |
| Greatest excess over shade maximum | 31·5° | 34·8° | 47·4° | 52 |
| ,, ,, ,, ,, Date of | 2 & 17 | 19 | 19 & 30 | |
| Average ,, ,, ,, | 16·5° | 23 6° | 36·9° | 40 |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 30·9° | 30·6° | 28·8° | 37 |
| Extreme minimum | 18·7° | 16·6° | 16·5° | 22 |
| ,, ,, Date of | 28 | 4 | 22 | |
| Greatest difference from shade minimum | 13·5° | 9·9° | 16·1° | 9 |
| ,, ,, ,, ,, Date of | 23 | 12 | 26 | |
| Mean ,, ,, ,, | 4·9° | 4·3° | 5·7° | 5 |
| Number of nights at or below 32° | 17 | 15 | 21 | |
| TEMPERATURE underground— | | | | |
| Mean at 1 foot | 41·0° | 40·3° | 42·0° | 4 |
| Range ,, | 8·9° | 8·7° | 8 0° | |
| Mean at 2 feet | 43·0° | 41·5° | 42·8° | 4 |
| Range ,, | 5·4° | 5·5° | 4·0° | |
| Mean at 3 feet | 44·8° | 42·8° | 43·6° | 4 |
| Range ,, | 3·5° | 3·1° | 2·2° | |
| Mean at 4 feet | 45·9° | 44·5° | 44·0° | 4 |
| Range ,, | 1·8° | 1·5° | 2·4° | |
| Air temperature, 9 a.m. | 40·2° | 39·7° | 42·5° | 4 |
| Range of ,, ,, | 31·4° | 31·8° | 22·7° | 1 |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 3·500 | 1·375 | 1·090 | |
| ,, ,, since 1st January | ... | 4·875 | 5·965 | |
| Maximum fall in 24 hours | ·620 | ·250 | ·270 | |
| ,, ,, Date of | 2 | 7 | 30 | |
| Number of days 0·01 fell | 23 | 15 | 11 | |
| ,, ,, since 1st January | ... | 38 | 49 | |
| Mean relative humidity, 9 a.m. | 88 | 88 | 85 | |
| ,, ,, 9 p.m. | 89 | 89 | 87 | |
| ,, ,, of both | 88 | 89 | 86 | |
| Mean vapour pressure, 9 a.m. | ·220 | ·216 | ·228 | |
| ,, ,, 9 p.m. | ·219 | ·219 | ·222 | |
| ,, ,, of both | ·220 | ·218 | ·225 | |
| Mean dew point, 9 a.m. | 36·9° | 36·4° | 37·7° | |
| ,, ,, 9 p.m. | 36·5° | 37·1° | 37·2° | |
| ,, ,, of both | 36·7° | 36·7° | 37·4° | |

# OF THE YEAR 1899.

ROAD, CHESTER.

SPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| | JUNE. | JULY. | AUGUST. | SEPT. | OCTOBER. | NOV. | DEC. | YEARLY SUMMARY. |
|---|---|---|---|---|---|---|---|---|
| n. | 30·691in. | 30·098in. | 30·079in. | 29·821in. | 30·031in. | 30·110in. | 29·870in. | 30·033in. |
| n. | 30·482in. | 30·425in. | 30·344in. | 30·224in. | 30·437in. | 30·741in. | 30·514in. | 30·758in. |
| | 8 | 31 | 1 | 9 | 21 | 17 | 3 | 26 Jan. |
| n. | 29·333in. | 29·437in. | 29·683in. | 29·184in. | 29·534in. | 29·217in. | 28·380in. | 28·380in. |
| | 20 | 1 | 29 | 30 | 29 | 8 | 29 | 29 Dec. |
| n. | 1·149in. | 0·988in. | 0·661in. | 1·040in. | 0·903in. | 1·524in. | 2·134in. | 2·378in |
| | 59·6° | 61·7° | 65·0° | 55·9° | 48·7° | 48·9° | 36·5° | 49·9° |
| | 70·4° | 70·3° | 75·5° | 63·3° | 57·5° | 54·1° | 40·9° | 57·5° |
| | 50·3° | 54·4° | 54·5° | 49·2° | 40·6° | 43·6° | 31·7° | 42·8° |
| | 80·8° | 81·8° | 85·8° | 78·5° | 64·7° | 64·0° | 55·6° | 35·8° |
| | 17 | 31 | 24 | 5 | 10 | 2 | 1 | 24 Aug. |
| | 42·3° | 47·6° | 45·5° | 38·9° | 31·5° | 26·6° | 12·6° | 12·6° |
| | 14 | 5 | 9 | 29 | 8 | 18 | 14 | 14 Dec. |
| | 38·5° | 33·2° | 40·3° | 39·6° | 33·2° | 37·4° | 43·0° | 69·2° |
| | 20·1° | 15·9° | 21·0° | 14·1° | 16·9° | 10·5° | 9·2° | 14·7° |
| | 31·3° | 27·4° | 29·7° | 23·3° | 29·5° | 17·4° | 16·4° | 36·6° |
| | 17 | 31 | 24 | 4 | 18 | 2 | 7 | 16 March |
| | 6·1° | 7·8° | 11·5° | 5·1° | 2·5° | 4·5° | 2·6° | 2·5° |
| | 22 | 23 | 6 | 10 | 27 | 22 | 22 | 27 Oct. |
| | 0 | 0 | 0 | 0 | 2 | 2 | 13 | 50 |
| | 109·3° | 111·4° | 110·6° | 99·8° | 80·6° | 72·2° | 51·8° | 87·5° |
| | 120·0° | 124·6° | 121·3° | 113·1° | 98·8° | 86·6° | 74·4° | 124·6° |
| | 17 | 6 | 19 | 8 | 6 | 2 | 30 | 6 July |
| | 52·4° | 51·8° | 47·5° | 49·8° | 41·8° | 30·2° | 30·3° | 52·4°, |
| | 19 | 3 | 19 | 28 | 6 | 1 | 27 | 19 June |
| | 38·9° | 41·1° | 35·1° | 36·5° | 23·1° | 18·1° | 44·1° | 32·8° |
| | 44·2° | 53·5° | 51·5° | 46·4° | 38·0° | 39·5° | 28·4° | 39·1° |
| | 36·8° | 44·6° | 41·8° | 37·0° | 28·5° | 25·4° | 6·7° | 6·7° |
| | 3 | 5 | 9 | 28 | 14 | 18 | 14 | 14 Dec. |
| | 5·5° | 3·6° | 5·6° | 5·0° | 7·4° | 9·6° | 9·6° | 19·5° |
| | 2 & 7 | 4 | 30 | 26 | 31 | 23 | 4 | 28 May |
| | 6·1° | 0·9° | 3·0° | 2·8° | 2·6° | 4·1° | 3·3° | 3·7° |
| | 0 | 0 | 0 | 0 | 6 | 3 | 23 | 94 |
| | 61·0° | 62·0° | 63·7° | 58·1° | 49·6° | 47·7° | 39·8° | 50·2° |
| | 8·6° | 6·2° | 4·6° | 11·1° | 5·0° | 8·4° | 11·7° | 7·9° |
| | 58·5° | 61·0° | 63·2° | 59·2° | 51·3° | 48·7° | 42·4° | 50·5° |
| | 6·6° | 4·1° | 2·1° | 7·5° | 4·0° | 5·8° | 9·0° | 5·1° |
| | 56·5° | 59·5° | 62·0° | 59·6° | 52·5° | 50·1° | 45·0° | 51·0° |
| | 6·4° | 2·8° | 2·6° | 5·7° | 4·4° | 2·8° | 7·0° | 3·9° |
| | 54·3° | 57·7° | 60·2° | 58·9° | 53·1° | 50·6° | 46·3° | 50·8° |
| | 6·2° | 2·7° | 1·8° | 4·0° | 4·4° | 2·6° | 6·3° | 3·3° |
| | 62·9° | 64·1° | 65.4° | 57·5° | 48·1° | 48·6° | 35·6° | 50·4° |
| | 16·7° | 7·9° | 16·6° | 16·8° | 20·6° | 26·0° | 41·5° | 22·4° |
| | 2·780 | 2·265 | 1·870 | 2·940 | 3·335 | 1·590 | 2·560 | ... |
| | 13·635 | 15·900 | 17·770 | 20·710 | 24·045 | 25·635 | 28·195 | 28·195 |
| | ·685 | ·680 | ·465 | ·680 | ·780 | ·425 | ·495 | ·780 |
| | 30 | 10 | 29 | 29 | 1 & 29 | 7 | 11 | 1 & 29 Oct. |
| | 8 | 11 | 11 | 22 | 12 | 11 | 15 | ... |
| | 88 | 99 | 110 | 132 | 144 | 155 | 170 | 170 |
| | 72 | 78 | 72 | 78 | 89 | 86 | 91 | 82 |
| | 86 | 86 | 82 | 87 | 92 | 87 | 92 | 88 |
| | 79 | 82 | 77 | 82 | 90 | 87 | 92 | 85 |
| | ·415 | ·460 | ·442 | ·369 | ·296 | ·294 | ·193 | ·308 |
| | ·412 | ·443 | ·460 | ·359 | ·309 | ·288 | ·194 | ·305 |
| | ·413 | ·451 | ·451 | ·364 | ·302 | ·291 | ·193 | ·307 |
| | 53·4° | 56·7° | 55·6° | 50·6° | 44·8° | 44·4° | 32·9° | 44·6° |
| | 53·5° | 55·5° | 56·5° | 50·0° | 45·9° | 43·9° | 34·1° | 44·6° |
| | 53·4° | 56·1° | 56·1° | 50·3° | 45·4° | 44·1° | 33·5° | 44·6° |

## WIND AND OZONE

| | Force. | | | | | Direction to 8 Points of the Compass. | | | | | | | | | Ozone. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 9 p.m. | Mean. | Maximum | Date of. | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. | Mean Amount. | Maximum. |
| January ... | 1·4 | 1·6 | 1·5 | 8 | 12 | W | 1 | 2 | — | 3 | 8 | 14 | 14 | 4 | 16 | 2·5 | 8 |
| February | 1·3 | 1·1 | 1·2 | 6 | 10 | SW | — | — | 2 | 11 | 7 | 19 | 3 | 1 | 13 | ·8 | 4 |
| March..... | 1·6 | 1·0 | 1·3 | 7 | 28 | W | 5 | 4 | — | 4 | 2 | 5 | 11 | 12 | 19 | 1·8 | 6 |
| April ..... | 1·8 | 1·4 | 1·6 | 8 | 8 | NW | 7 | 4 | 1 | 2 | 5 | 7 | 14 | 14 | 6 | 3·0 | 10 |
| May..... | 1·3 | 1·0 | 1·1 | 5 | 16 | E | 5 | 2 | 14 | 3 | 2 | 7 | 5 | 7 | 17 | ·9 | 7 |
| June ..... | 1·9 | 0·9 | 1·4 | 7 | 24 | NW | 2 | 1 | 11 | 4 | 9 | 3 | 4 | 16 | 10 | 1·7 | 6 |
| July ..... | 2·1 | 2·1 | 2·1 | 7 | 3 | NW | 5 | 2 | 1 | 4 | 4 | 13 | 10 | 20 | 3 | 3·3 | 7 |
| August ... | 1·9 | 1·1 | 1·5 | 5 | 17, 18, 24 | S | — | 1 | 2 | 12 | 14 | 4 | 7 | 13 | 9 | 1·5 | 5 |
| September | 2·6 | 2·1 | 2·4 | 7 | 20 | NW | 4 | — | 2 | 1 | 1 | 4 | 17 | 19 | 12 | 3·6 | 6 |
| October ... | 1·3 | 1·1 | 1·2 | 5 | 1 & 2 | W | — | 1 | 4 | 8 | 4 | 8 | 9 | 6 | 22 | 1·4 | 5 |
| November | 1·3 | 1·5 | 1·4 | 8 | 10 | W | — | — | 1 | 5 | 5 | 9 | 11 | 11 | 18 | 1·5 | 5 |
| December | 1·1 | 1·0 | 1·0 | 4 | 1 | SE | 1 | 1 | — | 16 | 12 | 3 | 7 | 6 | 16 | ·8 | 6 |
| | 1·6 | 1·3 | 1·5 | 8 | Jan. 12 Apr. 8 Nov. 10 | W | 30 | 18 | 38 | 73 | 73 | 96 | 112 | 129 | 161 | 1·9 | 10 |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | At Observing Hours | | | At any Hour. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dew. | Hoar Frost. | Welsh Hills invisible 9 a.m. | Thunder Storm. | Lightning only. | Thunder only. | Corona. | Gales. | Aurora. | Snow. | Hail. | Fog. | Frost, on Ground. |
| January ..... | — | 8 | 26 | ... | — | — | 2 | 3 | — | — | — | 3 | 17 |
| February ..... | 7 | 5 | 25 | 1 | — | — | 1 | — | 1 | 1 | 1 | 3 | 15 |
| March..... | 8 | 2 | 30 | — | — | — | 1 | 1 | — | 1 | — | 4 | 21 |
| April ..... | 6 | 1 | 9 | — | — | — | — | 2 | — | — | 1 | — | 4 |
| May..... | 8 | — | 24 | 1 | — | 1 | — | — | — | — | — | — | 5 |
| June ..... | 11 | — | 24 | — | — | 1 | — | 1 | — | — | — | — | — |
| July ..... | — | — | *10* | 1 | — | 2 | — | 2 | — | — | — | 1 | — |
| August ..... | 7 | — | 21 | 2 | — | — | — | — | — | — | — | 2 | — |
| September..... | 9 | — | 11 | 1 | — | 1 | 1 | 1 | — | — | 1 | — | — |
| October ..... | 6 | — | *25* | — | — | — | 1 | — | — | — | — | 4 | 6 |
| November ..... | 7 | — | 19 | — | 1 | — | — | 2 | — | — | — | 3 | 3 |
| December ..... | 4 | 5 | 26 | — | — | — | — | — | — | 1 | 1 | 4 | 23 |
| Total ..... | 73 | 21 | 250 | 6 | 1 | 5 | 6 | 12 | 1 | 3 | 4 | 24 | 94 |

## NOTES ON FRUIT TREE PESTS—By Mr. J. D. SIDDALL.

Fruit trees in gardens and orchards on the South side of the City, have this year again suffered severely from insect pests. The first place in importance among these must, undoubtedly, be assigned to the small Ermine Moth, *Hyponomeuta padellus*. After completely stripping the hawthorn hedges, this has attacked the foliage and young fruit of the apple trees, and caused a very large percentage of loss. Ensconced in rapidly extending web-nests no birds will touch them. There is, therefore, nothing but hand picking and forcible syringing with strong soap suds, effective against their attacks. The American blight, *Schizoneura lanigera*, is also again exceedingly common on the apple trees and very injurious. For this, soft soap made into a thick lather and applied with a stiff brush to infested stems is very effective, but it reappears rapidly and requires constant attention to keep down. I have not been able to note any birds touching it. The Mussel Scale, *Mytilaspis pomorum*, is also a very common pest, but the Tits will take these, and do a good deal toward keeping them down. Scraping and scrubbing the stems with soft soap lather is also a good remedy. Pears promised well, but have been, and are, seriously affected by the Pear Gnat Midge, *Diplosis pyrivora*, a tiny gnat-like fly, which deposits its eggs in the young flower buds. These hatch into little legless maggots which bore their way into the embryo pear, and stimulate it into very rapid but generally distorted growth, and after a time the fruit falls off. Many trees which promised to yield a heavy crop, have been quite denuded of fruit from this cause.

## Preliminary remarks on certain species of Lepidoptera taken at the City Electric Lamps, 1898 and 1899, By Dr. HERBERT DOBIE.

At the beginning of the year 1899, I read a Paper before the Society on the *Lepidoptera* taken at the Electric Lights of Chester, by my brothers and myself. Certain important records then given called for much comment, and seeing the importance of the matter the President has requested me to prepare a brief statement of our principal captures.

Between July 1898, and September 1899, 232 species of *Macrolepidoptera* were taken. My records are given under the following sections :—

**A.**—As being new to the Society's List.

**B.**—For their scarcity.

**C.**—For their uncommon variation.

**D.**—For the occurrence of certain pine and heath-loving species, whose nearest recorded habitats are some miles distant from Chester.

**E.**—As showing the usual proportion of the sexes captured, but with several interesting exceptions.

SECTION **A.**

1.—*Sphinx ligustri.*—A female of this species I took on July 15th, 1898. Mr. Walker in his list (Proc. Ch. Soc. Nat. Sc. pt. ii., p. 72), states :—"Larva said to have occurred at Oulton." This record, however, I believe Mr. Walker very reluctantly gave, as he very much doubted its authenticity. To the best of my knowledge this specimen is the only one of the species captured. It would, therefore, appear to be a moth *very rare in this locality.*

2.—*Deprana hamula.*—The first recorded specimen of this moth I took on August 19th, 1898. During June of 1899 two others were captured by Dr. E. C. Dobie.

3.—*Acronycta Alni.*—Five specimens, including a magnificent black variety. The first was taken June 15th, 1899. See A. O. W's List p. 74.

4.—*Cænobia rufa.*—Taken August 5th, 1899.

5.—*Agrotis lunigera.*—I took this specimen on 8th July, 1899, in St. John Street.

6.—*Tethea retusa.*—This rare species we took in August, 1898.

7.—*Cosmia affinis.*—Two specimens, one taken (by me) August 9th, 1899, a very dark variety; and one on August 23rd (by Mr. Douglas Dobie).

8.—*Phorodesma bajularia.*—June 7th, 1899, (by Dr. E C. Dobie).

9.—*Cheimatobia boreata.*—November 22nd, 1898, at the Eastgate Lamp.

10.—*Eupithecia ?*—Unnamed. This specimen has been submitted to several expert lepidopterists, but they have been unable to identify it.

SECTION **B.**

1.—*Smerinthus ocellatus.*—Though not considered very rare in the district, this moth has not been taken in the city until this year:—the first capture being made at the lamp by the Grosvenor Museum on the 14th of May last. Subsequently 22 others were taken.

2.—*Notodonta dictæa.*—Eighteen specimens during 1898, and no fewer than 38 during the current year. (An early capture was on May 11th).

3.—*Dicranura bifida.*—Was tolerably common in June, 1899, (one was taken on May 12th, and several in July). This insect is always considered a "good thing" by lepidopterists, and we have reason to be proud of having taken a series of 20 specimens.

4.—*Cirrhædia xerampelina.*—Mr. Walker gives a single capture as representing this species: one taken by us last year (1898), and 5 (late August or early in September, 1899), seems to show that it cannot be so very rare.

5.—*Ennomos fuscantaria.*—Was so common last September, (*i.e.*, 1898), that its capture was discontinued. This year, late in August and in September I have been able to add 35 specimens to my collection.

SECTION **C.**

1.—*Amphydasis betularia* has, during the last few years, afforded the lepidopterist an interesting field for the study of variation; but I believe a great deal of what has been said as to the percentage of *black varieties*, has been based chiefly, if not almost entirely, on bred examples. My captures of specimens on the wing should, therefore, be of the greatest value, as showing the amount of variation in nature. It is well known to local experts, that of the specimens reared from larvæ obtained at Delamere, or elsewhere in this neighbourhood, 99 per cent. are black varieties.

My captures, this year, amount to 160 *specimens*—of these 30 *are types or intermediate forms; and* 130 *of the variety Doubledayaria. The proportion* of *Type* to *Variety* being about **1** to **5.**

The *var. Doubledayaria* presents further most interesting varieties, scarcely two specimens in the set are alike. There are some which have the white mark on the lower wing extending almost half way across it, and there are a few which have no white markings at all, being completely black.

*In the above* 160 *specimens only* 7 *are females.*

2.—*Xylophasia polyodon.*—Six specimens of the black variety were taken *this* year.

3.—*Xanthia cerago.*—Two specimens of the variety *flavescens* were captured in 1898. (Mr. Walker does not mention this variety in his list; it is probably new to the district).

4.—*Polia chi.*—I took a beautiful specimen of the variety *olivacea* in September, 1899.

5.—*Trilinea.*—The variety "*bilinea*" and other specimens, with extremely beautiful variations were shown.

SECTION **D.**

In the Pine-clad portions of Delamere Forest *Fidonia piniaria* abounds; and so far as I can ascertain, no nearer locality has been found. I have taken 8 specimens of this Moth, and the question is whether these, attracted by the light, have travelled all this distance? Of course, the pupæ may have been imported with potting material, &c., but from the numbers taken, such an explanation seems to me to be unlikely. My captures have been taken from all quarters of the city.

*Agrotis porphyrea* is decidedly a heath-loving insect. It is also met with in Delamere Forest, in the open spaces between the trees, and in the heaths around Oakmere. 18 or 20 occurrences have been noted by me at the lamps.

SECTION **E.**

In almost every instance the *males greatly preponderate*:—

*e.g.* Dictæa 30 males and 7 females
Betularia 153 ,, and 7 ,,

But there are two remarkable exceptions, namely *Fidonia piniaria* and *Hepialis humuli;* 8 specimens of the former and 6 of the latter have been taken and *all are females;* in neither case has the male so far been seen at the lamps.

The female of *Heliophobus popularis*, I have heard, does not come to light! My observations do not confirm this, because I took 6 females and only 1 male on the south side of the city. My brother, however, who works the lamps on the north side had 1 female and 9 males.

Under this heading there is only one other species of which the female has been markedly more frequent than the male: viz., *Epione apinaria;* the proportion being 4 to 1.

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## ORNITHOLOGICAL NOTES—By Mr. W. HENRY DOBIE.

*Sylvia curruca.*—The lesser Whitethroat continues to increase in Chester and the neighbourhood, where, a few years ago, it was a species by no means common. It frequents gardens in the heart of the city: amid the chorus of horns, bells, and voices which woke sleeping Chester on the morning of May 31st, proclaiming the fall of Pretoria, its laughing note was heard within a hundred yards of the Town Hall.

*Motacilla flava.*—A specimen of the Blue-headed Wagtail, a species never before obtained in the district, was shot at White Hall, Tarporley, in 1898, and is in the collection of Mr. J. H. Stock, M.P. It was identified by Mr. Newstead, and is recorded by Coward and Oldham in the "Birds of Cheshire" (1900), p. 256.

*Muscicapa atricapilla.*—Dr. Herbert Dobie noted the Pied Flycatcher at Rossett, on May 5th, 1900; and on the same date one was recorded at Tarporley, by Mr. J. Henry Stock, M.P.

*Botaurus stellaris.*—A Bittern was shot near Llanrwst, on December 29th, 1899. About the same time several specimens were recorded in Anglesey, Shropshire, and South Wales.

*Querquedula circia.*—I have had the pleasure of examining a specimen of the Garganey, shot by Mr. Francis Congreve, of Burton Hall, on the Dee Marsh, about August 8th, 1899.

*Querquedula discors.*—I may take this opportunity of mentioning a specimen of the American Blue-winged Teal, a female, which I discovered in a case of ducks, all shot about forty years ago, on the Dee Estuary. The blue is quite a different colour from the blue-grey on the wing of the Garganey, and the alar speculum is shot with green.

*Fuligula ferina.*—The Pochard seems not so rare as an autumn and winter visitor as the notice of it in our Transactions (1893) might lead us to suppose. One was shot by Mr. Douglas Dobie on January 13th, 1900, in the Gowy meadows, near Trafford. Two were shot at Gelligynan, near Mold, by Mr. Gillet, August 16th and 23rd, 1898. Mr. Ruddy also writes to me that there were about 20 on Bala Lake at the beginning of April (1900).

*Phalaropus hyperboreus.*—I have examined a specimen of the Red-necked Phalarope, which was shot on the Dee Marsh last winter, and is in the possession of Mr. Francis Congreve.

*Larus leucopterus.*—In our list of 1893 the Iceland Gull has no place. Coward and Oldham have, however, recorded its occurrence at Hoylake 'about twenty years ago' ["Birds of Cheshire," p. 236]. I have also examined a specimen in the possession of Mr. Hannah, of Abergele, which was shot by his friend Mr. Cowan, on the Abergele Shore, on January 3rd, 1895, on the same day that a specimen of *Larus minutus* was obtained. It is a rather small but nearly adult bird, shewing a light fawn tint on some of the primaries, and an indistinct 'marbling' on the rectrices. Wing 15½ ins., Tarsus 1⅞ in.

*Cymochorea leucorrhoa.*—A number of Fork-tailed Petrels were shot in the autumn (1899), on Sealand or the Dee Estuary. I give the records of five, all of which I have examined:—

One from Sealand, Sept. 28th. Coll. Grosvenor Museum.
One, Sept. Coll. Mr. Jackson, Stafford House.
Two. Coll. Mr. Stivens, Abbey Street.
One. Coll. Mr. Francis Congreve, Burton Hall.

It would appear that this Petrel is either more common on our coast than the Storm Petrel (*P. pellagia*), or is more easily driven ashore by stress of weather.

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The past year has been marked by the publication of "The Birds of Cheshire," by T. A. Coward and Charles Oldham. This is a valuable addition to the books on the County Avifauna, extending our knowledge of the birds of Cheshire to the east of the line drawn south from Warrington, which bounds the district specially worked by this Society. The book is handsomely got up, and is a correct and well-sifted list. Rightly, I think, do its authors regard with scepticism the occurrence of the Noddy Tern (*Anous stolidus*), the record of which was published in "The Field" and "The Zoologist" for 1897. Though not wishing to advocate too strict an adherence to political boundaries in treating of local fauna, still I fail to see how a specimen of Sabine's Gull (*Xema sabinii*), shot in a field at Mostyn, and recorded in our Transactions as a Flintshire specimen, is entitled to a place amongst the birds of Cheshire. On the other hand, the Spotted Redshank (which they reject) may, I think, be included on the following evidence: Mr. Brockholes (Society's Transactions, No. I.) says: "A bird was killed about the year 1864 which, from description, was probably referable to this species. Dee Marsh, near Burton." In his diary notes, which I have had the opportunity of seeing, he says: "One was brought to Mrs. Brockholes about the year 1864, which, I believe, was shot by Charles Kemp." Mrs. Brockholes made a coloured sketch of this bird, which she has kindly shewn me, and its size and dark colouring leave no doubt in my mind that it was *Totanus fuscus*.

## NOTES BY MR. J. ARKLE.

FLOWERS IN BLOOM, SPRING, 1899.—Crocus, snowdrop, primrose—in a Newton garden, February 14th. Almond, pear—March 12th (both 18 days late). Sallow—March 30th (10 days late). Lilac—May 13th (4 days late). Hawthorn, horse-chestnut, laburnum, apple, wild hyacinth—May 20th (11 to 13 days late). Warm, sunny weather began with May 29th. June 6th the thermometer was "among the eighties," so that by July 19th the limes were in full blossom, or a week earlier than in 1898.

BIRDS.—Corncrake heard, May 2nd; cuckoo, May 4th (11 days late). Swifts were seen May 7th (5 days late—they stayed with us until August 22nd).

*Note.*—The above comparisons all refer to 1898, and are made on the localities for that year.

INSECTS.—*Epinephele tithonus.*—This butterfly was exterminated, some years ago, in the only locality where I knew it to occur—and it was abundant—through the cleaning, in July, of a hedge-bank, and consequent disappearance of the grass upon which the insect lays its eggs. Mr. Thompson, of 24, South View, Sealand Road, found the butterfly again in the Saughall and Shotwick neighbourhoods, and in such numbers, and so well distributed, that there is no further fear of its extinction.

*Œdematophorus lithodactylus.*—Woodbank Marsh, August. This is a new plume-moth added to the district list. Specimens have been placed in the Grosvenor Museum.

I have to report five additional species, &c., to the captures at the electric lamps:—

*Smerinthus tiliæ*, June, by Mr. Quinton.

The following four were taken by myself:—

*Xylophasia scolopacina*, August.
*Tortrix podana*, the black form, July.
*Scoparia augustea*, August.
*Catoptria scopoliana*, August.

## NATURAL HISTORY NOTES BY MR. THOS. RUDDY, Palé, 1899.

Crossbill.—Three here on the 24th of January. Did not see any after that date.

White-tailed Eagle.—A good specimen was caught exhausted on the hill near Llangower, Bala. The upper mandible was by some accident knocked away (not by the man who captured it), and this may account for the bird being weak, and easily captured by a farmer. I suppose it could not procure proper food for the want of its upper mandible. It was in good condition; weighed 12 lbs., and measured 7 feet 6 inches from tip to tip of wings. The specimen is now preserved in the collection of Mr. Williams, Chemist, at Bala. The only other obtained in this district is in the Palé Collection. It was shot in 1863.

Peregrine Falcon.—A pair nested on the mountain of Aran Mawddwy, Bala, in May.

Marsh Harrier.—One was seen on the Berwyn Mountains two or three times in October.

Great Spotted Woodpecker.—Seen at Llandrillo, near Corwen, on the 16th of October.

Twites.—I was highly pleased to see a large flock of this bird on Palé Grouse Moor, on the 22nd of October. They were not to be seen after.

Lesser Spotted Woodpecker.—Here at Palé, on the 27th of November.

Neither Widgeon nor Shoveller stayed with us last summer.

I found in a bush the nest of a Dormouse, with three young half-grown mice, here, on the 4th of June. They were in the old nest of a Chaffinch, altered to suit the purpose.

**1900.**

Hawfinch shot at Bala, on the 3rd of February. A pair nesting at Llandderfel in May.

A flock of 20 Pochards on Bala Lake, April 4th. I have no record of so many of these ducks having been seen here before.

I observed a large flock of Twites here, April 7th. I suppose they were migrating northward.

A white-tailed Eagle was seen on a hil farm, near here, on the 15th or 16th of April. It killed a lamb, and after a feed perched on a fence. The farmer had seen the specimen at Bala, and was sure it was one like it. He did not try to shoot it.

There were two nests of Merlins on Palé Grouse Moors in May.

A pair of Peregrines nested on Arenig Mountain the same month.

## HUMAN REMAINS IN THE BOULDER-CLAY AT SALTNEY,

By Mr. ROBT. NEWSTEAD, F.E.S., Curator of the Museum.

*Being an Abstract of a Paper read before the Society, October 26th,* 1899.

(WITH A PLATE).

On July 21st, 1899, a workman who was engaged in excavating clay for the manufacture of bricks at Mr. Morton Browne's works at Saltney, Chester, discovered what appeared to him, a large stone in the face of the clay section. The man dislodged the object with his pick-axe, and was startled to find he had unearthed a human skull. My second boy, who happened to be on the spot at the time, immediately brought me the news of the discovery. Fortunately, my residence was within a few paces of the scene, which enabled me to take immediate steps for the preservation of the remains, and also to make the necessary observations of the matrix in which they occurred. I found a section of the clay, about four feet thick, had been freshly broken away, and with it the greater part of the skeleton; but the skull, together with the phalanges of the right and left hands, was left intact in the solid wall of clay. There was a most perfect impression of the skull in the clay, which I removed and preserved, and I also dug out the phalanges of both hands, with the adjacent remains of *Bos longifrons*, various species of mollusca, &c., and am, therefore, able to register their exact position in the deposit, which is of the utmost importance. On carefully examining the freshly fallen clay a number of human bones were also rescued, but as these did not, by any means, complete the skeleton, I ventured to hope that others had been removed when the previous section was worked. I was informed that the stones, &c. from this section, as also from other sections, were thrown in a heap near the mill-house, and on carefully searching the latter I found, *near the surface*, a number of human bones presumably belonging to the same individual, as there were no

duplicate parts. The remains appear, therefore, to have been associated with the two sections of worked clay, which, I was informed, represented approximately eight linear feet, extending in a N.N.E. direction from the face of the clay section which was then standing (Fig. 1). With the exception of the phalanges and skull it is impossible, under the circumstances, to give further particulars of the disposition of the various bones recovered.

The exact position of the find lies about 300 paces due South from No. 16 Chester Road, Saltney, on the old river bank, opposite Wood's foundry. The section exposed (fig. 1) ran E.S.E. to W.N.W. and slopes downwards and westwards to the old river bed (fig. 1a), the greatest depth being about 8ft. at the E.S.E. extremity. The clay of which it is composed is decidedly arenaceous along its upper portion, but this character gradually lessens towards the base of the section. At 18 inches from the surface is a more or less continuous bed of water-worn pebbles and small boulders (in fig. 1 the right hand of the figure rests upon one of them) lying flat sides down. In the upper stratum, including the pebble bed, I found fragments of Romano-British Pottery, *e.g.*, portions of terra-cotta water bottles, cinerary urns of the Upchurch ware, and one small fragment of a Samian bowl, but no trace of such relics were found below the level of the pebble bed. Below the latter the clay gradually becomes more tenacious, and is very stiff towards the base of the exposed section. At varying depths below the pebble bed I found the following Marine Shells, which are undoubtedly of glacial origin :—

*Turritella terebra* (several).
*Littorina littorea* (one).
*Cardium edule* (several fragments).
*Fusus sp. ?* (fragment).

There were also many, almost perfect, examples of the common land snail, *Helix nemoralis ;* and scattered throughout the section were numerous *minute* fragments of charcoal (carbon).

Judging from the impression in the clay the skull was lying face down, and this is confirmed by the position of the clay in the interior of the skull which filled the anterior or facial half of it. It was lying exactly 5ft. 3in. from the surface at the spot indicated by the arrow in fig. 1. On either side of the skull were the phalanges of the right and left hands ; and immediately to the left (E.S.E.) of the former was an almost perfect skull of *Bos longifrons*, lying with the anterior portion towards the section (N.N.E.) Many of the bones were coated with the thin characteristic blue-grey deposit (? lime), which one finds coating almost all interstices in the clay deposits of the district.

The following is a list of the other bones recovered :—

Vertebræ of the cervical and lumbar regions, 15 in number.
Ribs, 20 and mostly imperfect.
Humerus, radius and ulna of left arm, complete.
Portions of each scapula.
Pelvis, with left and right innominate bones complete. (It should be noted that this had been separated into its three component parts ; that the sacrum was recovered from the stone-heap mentioned above, and must have been excavated many weeks prior to the discovery of the innominate bones. It would seem, therefore, they were not lying together intact in the clay, and, moreover, indicate they were lying asunder when buried).
Right femur, complete (with recent central fracture).
Upper two-thirds of left femur (fracture recent).

The skull (figs. 2 and 3) is remarkably well formed, and in its general contour resembles very closely the Tilbury example. The articulation of the jaw gives an edge to edge bite, which *may*, to a great extent, account for the wearing away of the front teeth, but at the same time it may have been produced by masticating hard uncooked food. The teeth were all present

with the exception of the first left molar of the lower jaw; this latter had evidently been extracted during life, as the socket had been quite absorbed, leaving but a shallow depression in the bone. The upper central pair of incisors are widely separated and slightly divergent, the space between them being greater than the width of one of the incisors (6 mm.); they measure 5 and 5·50 mm. long respectively; greatest diameter 6 mm., shortest 4 to 4·50 mm. The second pair are shorter and measure 3·50 and 4·75 mm. long; all four incisors have flat and broadly ovate crowns, the greatest length being from back to front; the canines are of the same character, but these and the succeeding teeth on both sides, *i.e.*, premolars (2) and molars (1) gradually lengthen, the united edges of all of them forming a regular concave line fitting exactly the convex curvature of the teeth below (see figs. 2 and 3). The central teeth of the lower jaw are *crowded* and *converge* towards the centre; the incisors are longer than the upper set, and are much more compressed laterally, the crowns being oblong, ovate, and flat as in the upper examples; the outer walls of the premolars and molars being about half the height of the inner walls.

The humerous is of exceptional interest in possessing that rarely developed bony process known as the *supra-condyloid foramen;* which is said to be present in only a small percentage of individuals.*

The character of the bones indicates the individual was a male, between the age of 50 and 60 years.

No analysis of the bones has been made, but certain of them, more especially the femora have the appearance of containing a fair percentage of gelatine; while the scapulæ, vertebræ, pelvis and ribs, appear much drier, and evidently contain an excess of the absorbent Calcareo-phosphatic earth.

The deposit in which the remains were found is of glacial origin, as evidenced by the shells of *Turritella* and other molluscs, and the presence of striated boulders; but the presence of the land shells (*Helix nemoralis*), and the fragments of charcoal scattered throughout the section, undoubtedly point to a subsequent disturbance and reassortment of the deposit during much more recent times, and may in this particular locality have been brought about by the action of the tidal waves of the Dee Estuary. There is every indication also that the stratum of pebbles has been laid down by the action of water, similar to that which is going on at the present day along the banks of the Dee; and by the evidence of certain fragments of Romano-British Pottery associated with them and the superincumbent earth, it seems feasible enough to suppose that this part of the deposit was laid during the Roman occupation of Deva from the first to the fourth centuries. So far as my investigation goes no pottery has occurred below the stratum of pebbles; I presume, therefore, it is an older deposit, and this view seems to be strengthened by the presence in it of the remains of *Bos longifrons*.

There is no evidence to prove that the human remains had been artificially buried, *i.e.*, by human agency. The stratum of pebbles and the clay above the skull showed no trace of disturbance, the latter being one solid homogeneous mass; and moreover, as has already been pointed out, the skull was lying face downwards. Taking all the facts into consideration it appears to me that the deposit of the skeleton took place simultaneously with the remains of the ox, the land shells and the charcoal; that it was probably brought about by the falling of the clay cliff or embankment at that particular spot. The water would readily render the clay plastic, which would account for the perfect preservation of the delicate shells of *Helix nemoralis*. What then is the age of the human remains? From all the evidence before me I think they cannot possibly be later than the Roman period, and it is highly probable they are of late neolithic origin.

* Struthers' Edin. Med. Jour., 1848.
Gruber, "Canalis supracondyloideus humeri," Mem. del'Acad. Imp. de St. Petersburg, 1859, p. 57.
Hyrtl. Topogr. Anal. VII., p. 283.

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FIG. 2.

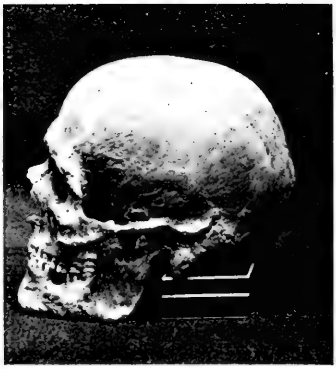

FIG. 3.

TWO VIEWS OF THE SALTNEY SKULL.

C

A

B

FIG. 1.

D

VIEW OF SECTION OF BOULDER-CLAY LOOKING DUE WEST.

*From Photographs by the Writer.*

It would be unjust of me to conclude this record without acknowledging my indebtedness to the many friends who have kindly helped me in what has proved no easy task. I must specially mention Mr. W. L. H. Duckworth; Dr. Woodward (Brit. Museum); Mr. W. Shone; Mr. T. Mellard Read; the President (Mr. J. D. Siddall); Dr. Stolterfoth; and Mr. Michael Johnson; and more especially the generous donor of the specimen (Mr. Morton Browne), who also offered every facility for investigating the deposit. Like most discoveries of its kind, it has favoured controversial opinions, but I must acknowledge that I profited, not a little, by them. I sincerely trust, however, now that the facts of the find are fully stated, we may form reliable conclusions as to the age of the individual, the discovery of whose remains is of so great interest both geologically and anatomically.

*July*, 1900.

EXPLANATION OF PLATE.

*Fig.* 1—View of Section of the Boulder-Clay, looking due West.
A—The pebble bed; its course still further indicated by the right hand of the figure resting upon a pebble.
B—Old river bed.
C—Anchor Works.
The arrow points to the exact spot in the excavated clay where the skull was found; the pebble immediately below it being *in situ*. The skull of *Bos longifrons* was also found there.
D—Section of "worked clay" in course of preparation for brick making, from which a number of the bones were subsequently recovered.
*Fig.* 2.—Front view of skull showing character of dentition, &c.
*Fig.* 3.—Profile of skull showing the absence of the 1st molar, which was lost during the life of the individual.

## BOTANICAL NOTES—By Mr. A. E. GOODMAN.

Several plants of Sundew (*Drosera rotundifolia*) collected at Delamere in June, 1899, and afterwards kept in a saucer inside a Wardian fern case, became proliferous, the young plants developing from the lamina of old leaves.

Growing amongst the gravel on a garden walk in a suburb of Chester, a seedling plant of the date palm (*Phœnix dactylifera L.*) was found at the end of August. The stone, casually dropped, had germinated in the open, which, in our climate, is remarkable, inasmuch as the seeds can only be induced to germinate, ordinarily, under the influence of considerable artificial heat.

## A Simple and Efficient Photo-micrographic Camera—By Mr. A E GOODMAN.

*Excerpt from Lecture read before the Botanical Section.*

The apparatus as used by the lecturer is shown in Fig. 1 on the plate opposite the following page, and is constructed on the lines of that used by Dr. Henri Van Heurck, the eminent microscopist. It is simple in construction, as may be gathered from the fact that it is home-made. As to its efficiency the reproductions of photo-micrographs taken with it must bear witness.

The camera is nothing more than an oblong box firmly mounted on four spreading wooden legs. The base of the box is provided with an aperture

through which the upper part of the microscope tube projects about two inches. The space between the microscope and the box is closed by a funnel of light-tight cloth, the narrow end of which may be securely fastened round the microscope tube. The interior of the box is made dull-black by two or more coats of a black shellac varnish. The top of the box is constructed to hold the focussing screen and a reversible carrier for a whole plate dark slide, just in the same manner as in any ordinary camera. The dark slide contains adapters so that either half plates or quarter plates may be used; in fact it is very rarely that a photograph larger than could be contained on a quarter plate is required, but the means of taking one of larger size is occasionally a great convenience. One of the main features of the camera lies in the door, whereby the operator's head can with ease be inserted so that the object to be photographed may be viewed directly through the microscope, and the illumination, &c., of the object very much more conveniently and accurately performed than by the use of any other form of camera. The invariable distance of the focussing screen from the microscope adds considerably to the stability of the whole apparatus and renders it much more easy to obtain good photographs of minute detail. Only one focussing screen of moderate fineness is found to be needful. To render the focussing of very minute structures easy, blacklead lines are first ruled at regular distances apart on the ground surface of the screen, and then, here and there, micro. cover-glasses are cemented to the ground surface by Canada balsam. This entirely obliterates the grain of the glass, whilst the plane of the surface of the screen on which the image must be focussed is readily seen by the blacklead lines.

## DESCRIPTION OF ILLUSTRATIONS.

Negatives taken on backed Ilford Chromatic Plates, and developed with Pyro-ammonia. Illumination in all cases axial. Condenser—Watson's Achromatic of 1·0 N.A. Source of illumination, except where otherwise stated, Welsbach Incandescent Gas Light.

*Very much of the finer detail, shown in the original photographs, is unavoidably lost in the process of reproduction.*

*Fig.* 2.—Frustule of a Diatom. *Navicula lyra, var.* Watson's $\frac{1}{1\cdot2}$-inch oil immersion objective; no eyepiece; exposure 6 mins.; Oil Lamp Illumination.

*Fig.* 3.—Dividing Nuclei (Karyokinetic figures), Microspores of *Lilium auratum.* Beck's $\frac{1}{4}$-inch objective; no eyepiece; exposure 3 mins.; very narrow cone of light from condenser.

*Fig.* 4.—Long: radial section of Pine-wood, showing bordered pits. Watson's 1-inch objective; no eyepiece; exposure 45 secs.

*Fig.* 5.—Trans: section of Pine-wood. Watson's 2-inch objective; no eyepiece; exposure 12 secs.

*Fig.* 6.—Trans: section of portion of leaf-stalk of Palm. Watson's 2-inch objective; no eyepiece; exposure 10 secs.

*Fig.* 7.—Portions of Frustules of Diatom. *Pleurosigma angulatum* shewing both "White dot" and "Black dot" appearance. Watson's $\frac{1}{1\cdot2}$-inch oil immersion objective; A. eyepiece; Limelight illumination; exposure 45 secs.

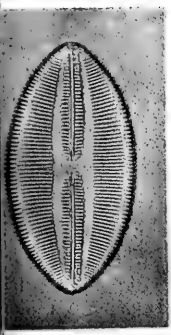

FIG. 2.

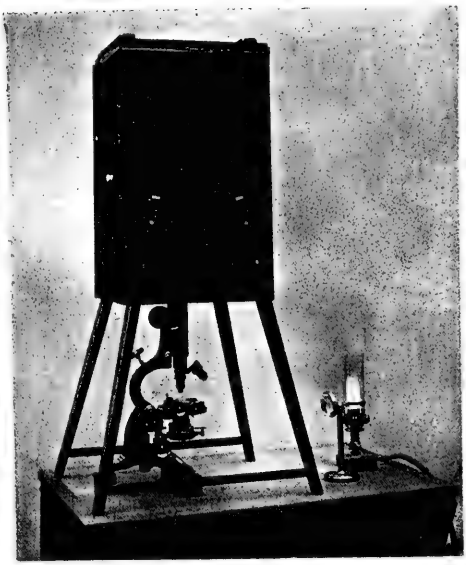

FIG. 1.

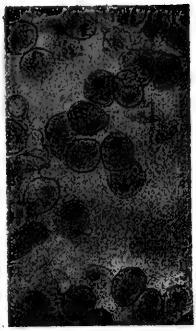

FIG. 3.

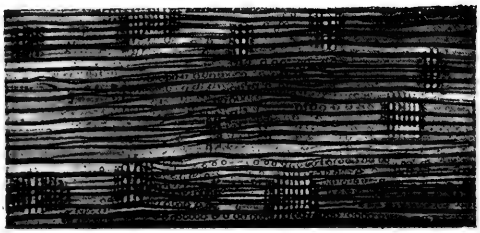

FIG. 4.

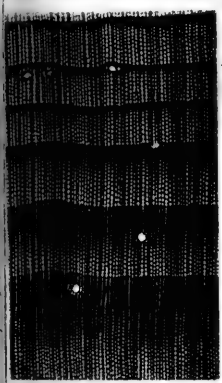

FIG. 5.

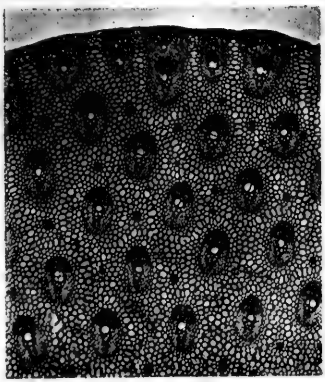

FIG. 6.

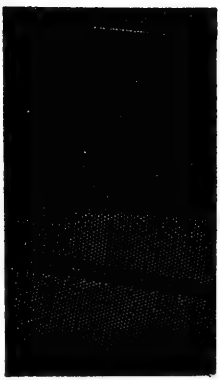

FIG. 7.

BRITISH MUSEUM
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## List of Plants, growing within a two mile radius of Chester, found by Miss Cummings, Miss Payne, and Miss A. Payne, and which are not included in the late Mr. E. J. Baillie's City Flora, 1875-77.

Mr. Baillie remarks in the Preface of his Catalogue, that "several important and universally distributed genera, such as *Rubus*, *Rosa*, *Potamogeton*, *Salix*, *Chenopodiaceæ*, *Atriplex*, and *Rumex* are not included in the list."

They have particularly observed the *Potamogeton* and *Rumex* genera, and have been able to verify nearly all the latter, but feel there are several of the former yet to be discovered.

They have been pleased to be able to add considerably to the numbers of *Menthas* on his list; and to find that several Plants mentioned in the late Lord de Tabley's book are still existing in the localities where he found them.

The total number of Plants recorded by Miss Cummings, Miss Payne, and Miss A. Payne is 352; 98 of these are not given in Mr. Baillie's list, and 7 are not indigenous. They omit all the *Juncaceæ*, *Cyperaceæ*, *Gramineæ*, and *Cryptogams*, which they hope to undertake at a future time.

The radius taken was two miles from the Cross, as the City Boundary is a very arbitrary arrangement, and so much land within it has been built over since 1877.

| | |
|---|---|
| *Cardamine amara* | Ditch, Sealand road |
| *C. pratensis* | General |
| *Nasturtium sylvestre* | Meadows, near Cop |
| *Raphanus raphanistrum* | Field near Brewer's Hall |
| *Reseda lutea* | Field near Cop |
| *Sagina nodosa* | Ferry lane |
| *Hypericum dubium var. maculatum* | River bank |
| *Linum usitatissimum* | Lache lane |
| *Geranium pyrenaicum* | Field near Cop |
| *G. rotundifolium* | Cop |
| *Cytisus scoparius* | Bank of Canal |
| *Onones reclinata* | Cop |
| *Medicago denticulata* | ,, |
| *Trifolium arvense* | Field, Cop |
| *Astragalus glycyphyllos* | Curzon park |
| *Vicia lathyroides* | Upton lane |
| *Rubus fruticosus* | City walls |
| *R. cæsius* | Meadows |
| *Fragaria vesca* | Curzon park dingle |
| *Potentilla reptans* | General |
| *Rosa canina* | Near Curzon park |
| *R. arvensis* | ,, ,, |
| *Epilobium tetragonum* | Queen's park Nurseries |
| *E. palustre* | Blacon |
| *Sium latifolium* | Blacon brook |
| *Œnanthe pimpinelloides* | Cop |
| *Æthusa cynapium* | Abbey green |
| *Carum carui* | Cop |
| *Scandix pectens* | Sluice House, 1897 to '98. A quantity of rubbish thrown on the place; not seen in 1899 |
| *Cornus sanguinea* | River bank |
| *Galium saxatile* | Ferry lane |
| *G. mollugo* | Cop |
| *G. anglicum* | Curzon park |
| *Eupatorium cannabinum* | Eccleston |
| *Gnaphalium uliginosum* | Newton lane |
| *Filago Germanica* | Wrexham road |
| *Bidens cernua* | Graving-dock lock |
| *Chrysanthemum parthenium* | Curzon park |
| *Matricaria maritima* | Cop |

| | |
|---|---|
| *M. chamomilla* | General |
| *Senecio saracenicus* | Eccleston |
| *Arctium lappa* | Blacon fields |
| *Centaurea scabiosa* | Cop meadows |
| *Leontodon hirtus* | Cop |
| *Hieracium murorum* | City walls |
| *Chichorium intybus* | Sealand meadows |
| *Lysimachia vulgaris* | Dee meadows |
| *Symphytum officinale* | Cop meadows |
| *Linaria vulgaris* | Bumper's lane |
| *Scrophularia aquatica* | Blacon |
| *Mimulus luteus* | Dee meadows |
| *Digitalis purpurea* | City walls, N. A white variety in 1898. |
| *Euphrasia officinalis var. gracilis* | Sealand road |
| *Mentha sylvestris* | Ferry lane |
| *Mentha aquatica* | Blacon |
| *M. sativa* | Dee meadows |
| *M.* ,, *v. paludosa* | ,, ,, |
| *M. arvensis* | Sealand meadows |
| *Origanum vulgare* | Cop |
| *Stachys sylvatica* | General |
| *Lamium maculatum* | Queen's park |
| *Chenopodium album* | General |
| *C. album v. viride* | Stone bridge |
| *C. rubrum* | Sealand meadows |
| *C. Bonus Henricus* | Cambrian view. One plant found on Liverpool road, near the Bache, in 1897-98; destroyed by alterations in bank |
| *Atriplex patula* | Curzon park |
| ,, ,, *v. angustifolia* | ,, ,, |
| *Rumex aquaticus* | Cop |
| *R. crispus* | ,, |
| *R. obtusifolius* | ,, |
| *R. hydrolapathum* | Canal |
| *R. maritimus* | ,, |
| *R. conglomeratus* | Cop |
| *R. sanguineus* | ,, |
| *R. acetosa* | General |
| *R. acetosella* | Queen's park |
| *Polygonum aviculare v. vulgatum* | Canal bank |
| *P. amphibium* | Canal |
| *P.* ,, *v. terrestre* | Canal, near Water Tower |
| *P. lapathifolium* | Sealand meadows |
| *Euphorbia peplus* | Abbey green |
| *Salix alba* | General |
| *S. viminalis* | Meadows |
| *S. cinerea v. viminalis* | Canal bank |
| *Populus nigra* | General |
| *Potamogeton natans* | Curzon park |
| *P. lucens* | Canal bank |
| *P. pusillus* | ,, ,, |
| *P. pectinatus* | River |
| *Galanthus nivalis* | Cop |
| *Scilla nutans* | Woods by Dee |

## EXCLUDED SPECIES.

| | |
|---|---|
| *Sisymbrium tanacetefolium* | Roodee, 1899. Trampled down in Race-week, 1900 |
| *Dianthus armeria* | City walls, N., 1899 |
| *Cannabis sativa* | Rubbish heaps, Bumper's lane |
| *Zea Mays* | Canal bank |
| *Tropoleum Majus* | Rubbish heap, Wrexham road, 1899. Flowering on old heap of rubbish |
| *Lycium barbarum* | Quarry, Handbridge |
| *Chiococea racemosa* | Bank, Grosvenor bridge |

The following list contains the names of Plants mentioned by the late Mr. E. J. Baillie in his City Flora, as having been found by himself, or by Members of the Botanical Section of the Natural Science Society during 1875-77, and which have not been verified as still existing in the places he mentions by Miss Cummings, Miss Payne, and Miss A. Payne.

They think that the disappearance of many of these Plants from the localities they formerly inhabited, is due, in most instances, to building on the spots, to cultivation of the land, and alterations in the roads.

Some may still be found, as the list made last year was far from complete, and they hope to add to it very considerably.

The number of Plants mentioned in Mr. Baillie's list is 311, including 4 not indigenous, and excluding all the *Juncaceæ*, *Cyperaceæ*, *Gramineæ*, and *Cryptogams*. The 57 plants enumerated below have *not* been found by Miss Cummings, Miss Payne, and Miss A. Payne. He took the City Boundary as his radius, which is nominally one mile and a half from the Cross.

| | |
|---|---|
| *Aquilegia vulgaris* | Hedge, Navigation Cop, 1876. A single specimen, noted 1876; evidently an escape |
| *Papaver argemone* | Lache lane. Lord de Tabley says it is local and unequal in distribution |
| *Sinapis alba* | Brewer's Hall farm-yard |
| *Brassica napus* | Lache lane; rubbish heap |
| *Alyssum calycinum* | Sealand meadows, 1877. Several plants found in one meadow; probably introduced with seed |
| *Lepidium campestre* | Sealand meadows |
| *Dianthus deltoides* | Grosvenor park. Mr. Baillie's specimen was found by Mr. Geo. Cross, and came in gravel from Conway |
| *Silene puberula* | Sealand meadows |
| *Lychnis githago* | Sealand meadows; but a specimen was found in 1899 by Miss Bowers |
| *Spergularia neglecta* | Dee Cop |
| *S. marginata* | ,, |
| *Hypericum pulchrum* | Sealand |
| *Althæa officinalis* | Sealand road. The only specimen grew on the old Ropewalk |
| *Trifolium incarnatum* | Sealand, 1876. A single specimen recorded; casual |
| *Vicia tetrasperma* | Sealand road and Queen's park meadows |
| *Lathyrus nissolia* | Lache foot-path |
| *Orobus tuberosus* | Gamon's Rough |
| *Epilobium parviflorum* | Old Ship Yard |
| *E. obscurum* | Ledges City Walls (above river) |
| *Callitriche obtusangula* | Meadow water-course |
| *Saxifraga tridactylites* | Sealand meadows |
| *Hydrocotyle vulgaris* | Saltney fields |
| *Helosciadium inundatum* | Saltney field pits |
| *Fœniculum vulgare* | Sealand road |
| *Torrilis nodosa* | Cop |
| *Chærophyllum anthriscus* | North out-skirts of Chester |
| *Asperula odorata* | Avenue, first plantation, W. |
| *Silybum Marianum* | River side, near Old Dee Bridge |
| *Centaurea cyanus* | Sealand meadows |
| *Chrysanthemum segetum* | ,, ,, |
| *Erigeron acris* | Old Ship Yard. Probably destroyed by Gas Works |
| *Menyanthus trifoliata* | Sealand meadows |
| *Solanum nigrum* | Little Roodee |
| *Myosotis versicolor* | Curzon Dingle |
| *Veronica officinalis* | Sealand road |
| *Orobanche minor* | ,, meadows |

| | |
|---|---|
| *Stachys ambigua* | Saltney fields |
| *Lamium amplexicaule* | Sealand meadows |
| *L. incisum* | ,, ,, |
| *Echium vulgare* | Queen's Park road |
| *Anchusa arvensis* | Sealand meadows |
| *Borago officinalis* | ,, ,, |
| *Daphne Laureola* | Lache lane; Saltney fields |
| *Buxus sempervirens* | General |
| *Ceratophyllum aquaticum* | Canal Basin |
| *Juniperus Communis* | Avenue |
| *Acorus calamus* | Canal basin, Stone bridge. We found leaves of what we think was the *Acorus*, but no blossom |
| *Typha latifolia* | Sealand ditches |
| *Zanichella palustris* | Blacon brook; Cemetery |
| *Triglochin maritima* | Blacon marsh |
| *Sagittaria sagittifolia* | Canal basin |
| *Orchis morio* | Queen's park meadows |
| *O. mascula* | Meadows |
| *Allium oleraceum* | Roodee cop |

EXCLUDED SPECIMENS.

| | |
|---|---|
| *Saponnaria vaccaria* | Little Roodee, 1876. Single plant, 1876; probably introduced with ballast |
| *Xanthium spinosum* | Field near Barracks, 1876. Single plant, 1876; introduced by foreign sheep |
| *Datura stramonium* | Planting in George street. Several plants; casuals |

## NOTES ON THE FUNGI OF THE CHESTER DISTRICT, By Messrs. J. AND A. H. THOMPSON.

The following is a list of Fungi observed in the Society's District, between June 1899 and May 1900. We hope to materially add to it. A water-color drawing of almost every species given here will be found in the book containing the detailed account. This book is in the Library of the Society.

*Agaricus* (*Amanita*) *vaginatus*, "Sleek Amanita." Delamere Forest—sparingly
,, ,, *mappa*, "Delicate Amanita." Delamere Forest—rare
,, ,, *muscarius*, "Fly Amanita." Delamere Forest—common
,, ,, *strobiliformis*, "Fir-cone Amanita." Delamere Forest—rare
,, ,, *rubescens*, "Reddish Amanita." Delamere Forest—common
,, (*Lepiota*) *procerus*, "Parasol Mushroom." Delamere Forest, Ashton Hayes—fairly common
,, ,, *rachodes*, "Large Gray Lepiota." Chester—common locally
,, (*Armillaria*) *melleus*, "Honey-colored Armillaria." Sealand, Saughall, Blacon—common
,, (*Tricholoma*) *sulfureus*, "Sulphury Tricholoma." Delamere Forest, Little Saughall—common
,, (*Clitocybe*) *maximus*, "Sowerby's Clitocybe." Sealand cop, Backford—common
,, (*Pleurotus*) *ulmarius*, "Elm Pleurotus." Water-Tower grounds (Chester), Sealand road—common
,, (*Collybia*) *velutipes*, "Velvet-stemmed Collybia." Eleven Arches, near Chester Cathedral, Sealand, Woodbank, Chester Cemetery, Gamon's Rough, Old Trafford—common

*Agaricus* (*Pholiota*) *præcox*, "Spring Pholiota." Sealand, Eleven Arches, Woodbank—common
,, ,, *squarrosus*, "Scaly Pholiota." Sealand—common locally
,, (*Naucoria*) *semiorbicularis*, "Half-round Naucoria." Saughall, Eleven Arches—not common
,, (*Galera*) *tener*, "Slender Galera." Blacon, Saughall, Backford, Eleven Arches—plentiful
,, (*Psalliota*) *arvensis*, "Horse Mushroom." Common throughout the District
,, ,, *campestris*, "Common Mushroom." Common throughout the District
" ,, *silvaticus*, "Wood Psalliota." Fairly plentiful everywhere
,, ,, *elvensis*, "Tufted Psalliota." Little Saughall
*Coprinus comatus*, "Shaggy Coprinus." Common everywhere
,, *ovatus*, "Ovate Coprinus." Little Saughall
,, *atramentarius* "Inky Coprinus." Plentiful throughout the District
,, *similis*, "Striate Coprinus." Sealand, Saughall, Backford
,, *niveus*, "Snowy Coprinus." Sealand—rare
,, *micaceus*, "Glistening Coprinus." Plentiful throughout the District
*Lepista nuda*, "Amethyst Lepista." Sealand cop—common where it occurs
,, *personata*, "Purple-stemmed Lepista." Common everywhere
*Paxillus involutus*, "Involute Paxillus." Delamere Forest—common
*Lactarius rufus*, "Red Lactarius." Delamere Forest—common
*Russula veternosa*, "Sleepy Russula." Saughall, Backford—common
*Marasmius oreades*, "Fairy-ring Champignon." Common throughout the District
,, *insititius*, "Horny-stemmed Marasmius." Delamere Forest—not common
*Lentinus fimbriatus*, "Fringed Lentinus." Delamere Forest—rare
*Boletus Chrysenteron*, "Red-cracked Boletus." Saughall, Backford, Delamere Forest—common
,, *sub-tomentosus*, "Yellow-cracked Boletus." Delamere Forest—common
,, *edulis*, "Edible Boletus." Eleven Arches, Delamere Forest—common
,, *satanas*, "Beelzebub's Cushion." Delamere Forest
,, *scaber*, "Shaggy Boletus." Backford, Delamere Forest
*Polyporus brumalis*, "Winter Polyporus." Sealand, Eleven Arches, Delamere Forest—rare
,, *squamosus*, "Scaly Polyporus," Old Trafford, Backford, Chester
,, *sulfureus*, "Sulphury Polyporus." Backford, Sealand
,, *betulinus*, "Birch Polyporus." Delamere Forest
,, *fomentarius*, "Dingy Hoof Polyporus." Old Trafford, Saughall, Backford, Mollington, Woodbank, &c.
,, *versicolor*, "Common Zoned Polyporus." Common throughout the District
,, *Wynnei*, "Wynne's Polyporus." Delamere Forest, Sealand—rare
*Fistulina hepatica*, "Beefsteak Fungus." Backford, where it is very common
*Stereum purpureum*, "Purple Stereum." Eleven Arches, Delamere Forest
,, *hirsutum*, "Hairy Stereum." Eleven Arches, Sealand, Saughall, Woodbank, Delamere Forest
*Cyphella muscicola*, "Greyish Moss Cyphella." Chester Cemetery, Old Trafford, Delamere Forest, Saughall
*Clavaria inæqualis*, "Unequal Clavaria." Delamere Forest—not common
*Calocera viscosa*, "Clammy Calocera." Delamere Forest—not common
*Tremella fimbreiata?* "Fringed Tremella." Canal Boat-yard (Chester)—rare
,, *mesenterica*, "Orange Tremella." Eleven Arches—common
*Hymenogaster citrinus*, "Lemon-colored Hymenogaster." Backford—rare
*Phallus impudicus*, "Common Stink-horn." Delamere Forest, Sealand, Stamford Bridge
*Geaster lageniformis*, "Flask-like Geaster." Mouldsworth, Gresford—rare
*Lycoperdon pusillum*, "Little Puff-Ball." Delamere Forest, Saughall—common
,, *pyriforme*, "Pear-shaped Puff-Ball." Eleven Arches—rare
*Scleroderma vulgare*, "Common Scleroderma." Hawarden, Delamere Forest—common

## NATURAL PHILOSOPHY SECTION.

On November 16th, 1899, Mr. J. KENT-SMITH read a Paper on "The Modern Manufacture of Iron and Steel." The Paper was illustrated with Lantern Slides from photographs taken during manufacturing operations by the reader, who also gave his own analyses, as below, of some of the Minerals in the Society's District, and referred to in his Paper.

IRON STONES FROM NEAR DOLGELLEY.

| | (1) | (2) | (3) |
|---|---|---|---|
| Ferrous Oxide .. .. .. | 34·20 % | 32·23 % | 36·00 % |
| Ferric Oxide .. .. .. | 18·91 ,, | 24·54 ,, | 30·96 ,, |
| Ferric Sulphide .. .. .. | ·34 ,, | ·13 ,, | ·47 ,, |
| Manganous Oxide .. .. .. | Trace | Trace | ·08 ,, |
| Alumina .. .. .. .. | 10·60 ,, | 9·91 ,, | 7·23 ,, |
| Lime .. .. .. .. .. | 3·76 ,, | 3·00 ,, | 2·64 ,, |
| Magnesia .. .. .. .. | Trace | Trace | ·80 ,, |
| Phosphoric Acid .. .. .. | 3·83 ,, | 2·70 ,, | 1·68 ,, |
| Insoluble silicious matters .. .. | 20·76 ,, | 19·76 ,, | 14·99 ,, |
| Carbonic acid and organic matter .. | 7·35 ,, | 7·22 ,, | 5·21 ,, |
| | 99.69 ,, | 99·49 ,, | 100·06 ,, |

NATIVE MANGANESE STONE (MANGANOUS SILICATE) FROM LLANBEDR.

| | |
|---|---|
| Manganese .. .. .. .. .. .. .. .. | 23·11 % |
| Iron .. .. .. .. .. .. .. .. | 5·20 ,, |
| Silica .. .. .. .. .. .. .. .. | 27·59 ,, |
| Moisture .. .. .. .. .. .. .. .. | 2·88 ,, |

LIMESTONES FROM MINERA.

| | (1) | (2) |
|---|---|---|
| Calcium Carbonate .. .. .. .. | 96·82 % | 97·80 % |
| Magnesium Carbonate .. .. .. | ·50 ,, | ·34 ,, |
| Alumina peroxide of iron, &c. .. .. | ·28 ,, | ·58 ,, |
| Insoluble matters .. .. .. .. | 2·26 ,, | 1·20 ,, |
| | 99·86 ,, | 99·92 ,, |

On February 22nd, 1900, Mr. JOHN WELSH, Ph. Ch., F.C.S., gave a Paper on "Micro-Organisms, or Our Secret Friends and Foes."

The lecturer after a rapid survey of the rise and growth of Bacteriological Research, and its beneficial results upon Life at the present time, described the "Life-History" of organisms under the following heads :—Habitat; Mobility; Reproduction; Size; Environment; Effects.

(*a*) Amongst the Microbes *Friendly* to man were mentioned and described :—

Organisms of Nitrification (Nodule Bacteria).
Hay Organism (Bacillus Subtilis).
Organisms of Alcoholic (fermentations)
,, Acetic ,,
,, Lactic ,,
,, Butyric ,,
,, Citric Acid ,,
,, Digestion

(*b*) Whilst amongst the *Enemies of Mankind* were included: the *Chief Pathogenic Organisms*; viz :—

| | |
|---|---|
| Bacteria of Suppuration | *Staphylococcus pyogenes aureus.*<br>,, ,, *albus.*<br>*Streptococcus pyogenes.* |
| Organisms of Pneumonia | *Fraenkel's Pneumococcus.*<br>*Friedländer's Pneumobacillus.* |
| Organism of Consumption | *Bacillus Tuberculosis.* |
| Organism of Anthrax | *B. Anthracus.* |
| Cholera Spirillum *or* Comma Bacillus | *Vibrio Choleræ.* |
| Lockjaw (Tetanus) Microbe | *B. Tetani.* |
| Leprosy Germ | *B. Lepræ.* |
| Diphtheria Organism | *B. Diphtheriæ.* |

(*c*) Lantern Slides of these organisms were thrown on the screen, and the organisms of anthrax and tuberculosis respectively, were shewn as microscopical specimens from actual cases of the diseases.

(*d*) Methods of investigation were described and illustrated under three divisions—(1) Microscopical; (2) Culture; (3) Inoculation.

(*e*) And emphasis was laid on—

(1) The importance of sterilisation of milk, &c., as a safeguard against tuberculosis.

(2) The treatment of Consumption by fresh air and sunlight.

(3) The treatment of Disease by Serum Inoculation.

(4) The great benefits bestowed upon "Surgical and Public Health Work," by the progress in Bacteriological knowledge.

## PHOTOGRAPHIC SECTION.

The Photographic Section has met four times during the Session 1899-1900. Two of the Meetings, for Working Members, have been held in the Physics Laboratory, which, through the kindness of a few Members, is now admirably adapted for Photographic Demonstrations. The Section contributed an Exhibition of Members' Work to the Conversazione of the Society, in October, 1899. The Sectional Meetings are detailed in the Secretary's Report.

The following Awards have been won by Members during the Session:

"The Amateur Photographer" Gold-Token for Lantern Slides, by Mr. J. A. McMichael, B.A., B.Sc.

"The Amateur Photographer" Silver Medal for Lantern Slides, by Lieut.-Col. Dowdall.

International Photographic Exhibition, Birkenhead:

Silver Medal for Micro-Photographs, by Mr. A. E. Goodman.

Silver Medal for Stereoscopic Transparencies, by Mr. J. H. Spencer.

## PAXTON SOCIETY.

We are pleased to report favourably of the progress of the Paxton Society. Not only has the list of Members been considerably increased during the past year, but the Annual Exhibition of Fruit and Chrysanthemums, held in the Town Hall, was better in every respect than any of its predecessors. It is also satisfactory to have to report that, from information received from country districts, increased attention is being given by Cottagers and others to the cultivation of Apples and Pears; this being largely due to the encouragement given and information disseminated by the Society during the past few years.

Schedules for this year's Exhibition, which will be held on the 13th and 14th of November, are now ready, and may be had on application to the Honorary Secretary, or from any Member of the Committee.

The following lectures were delivered in the Grosvenor Museum during the past Session, and all were well attended.

1900.

Feb. 3—Social gathering of Members.

" 17—"Recent important investigations of the Currant-bud Mite," and "Notes on the Pear Tree Slug," (Illustrated by Lantern Slides) .. .. Mr. R. NEWSTEAD, F.E.S.

Mar. 3—"Artificial Cross-fertilization of Cereals and Grasses," (Illustrated by Lantern Slides), by special request. Mr. G. P. MILN.

" 17—"Reminiscences of my travels collecting Orchids in South Africa," (Illustrated by a collection of South American Snakes and Butterflies; also the Implements and Dresses used during the expedition). .. Mr. D. A. COWAN.

" 31—"Exhibition Roses" with cultural hints on planting, pruning, and staging for exhibition. .. Mr. R. G. WATERMAN.

ROBERT WAKEFIELD, *President.*
G. P. MILN, *Honorary Secretary.*

# PAST PRESIDENTS.

1871 to 1875—Rev. Charles Kingsley, Canon of Chester.
*(Founder of the Society.)*
1875 ,, 1891—Prof. T. McKenny Hughes, F.R.S.
1891-2 Alfred O. Walker, Esq., J.P., F.L.S.
1892-3 His Grace The Duke of Westminster, K.G.
1893 to 1895—W. Murray Dobie, Esq., M.D., J.P., F.R.A.S.
1895 ,, 1897—Henry Stolterfoth, Esq., M.A., M.D., J.P.
1897-8 Thomas Shepheard, Esq., F.R.M.S.
1898 to 1900—John D. Siddall, Esq.

# KINGSLEY MEMORIAL MEDAL,

Established 1877,

*"For having contributed materially to the promotion and advancement of some branch or department of Natural Science."—Vide* Trust Deed.

1877—Mrs. Chas. Kingsley (In Memoriam)
1878—John Price, M.A.
1879—Sir Philip de Malpas Grey-Egerton, Bart., F.R.S.
1880—Prof. T. McKenny Hughes, F.R.S.
1881—D. Mackintosh, F.G.S.
1882—Issac Byerley, M.R.C.S., F.L.S.
1883—George W. Shrubsole, F.G.S.
1884—Alfred Osten Walker, F.L.S.
1885—John Davies Siddall.
1886—Henry Stolterfoth, M.A., M.D.
1887—William Shone, F.G.S.
1888—Thomas Shepheard, F.R.M.S.
1889—Thos. Ruddy.
1890—Rev. Chas. Wolley-Dod, M.A.
1891—Robert Newstead, F.E.S.
1892—Osmund W. Jeffs.
1893—Edmund J. Baillie, F.L.S.
1894—W. Murray Dobie, M.D., F.R.A.S.
1896—Rev. Arthur H. Fish, B.A., B.Sc.
1897—William Henry Dobie, M.B.
1899—W. F. Lowe, A.R.S.M., F.I.C., F.C.S.

# KINGSLEY MEMORIAL PRIZES,

(OF £5 AND UPWARDS)

Established 1877,

*"For the reward, encouragement, and the advancement of the pursuit and study of Natural Science."—Vide* Trust Deed.

| | | | |
|---|---|---|---|
| 1878 | Helen Smith..... £5<br>Edwin W. Okell.... 5 | | *Herbarium of Flowering Plants.* |
| 1879 | George Shrubsole .. | 5 | *Carboniferous Fossils.* |
| 1881 | E. Hopkins..... | 5 | *Cryptogamous Plants.* |
| 1882 | George Shrubsole.. | 10 | *Corals of the Mountain Limestone.* |
| 1886 | Robert Newstead .. | 10 | *Hymenoptera.* |
| 1887 | John Lyon Denson.. | 5 | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888 | Lilian E. Tomlin .. | 5 | *Coleoptera.* |
| 1889 | Edith C. Tomlin.... 5<br>W. E. Sharp..... 5 | | *Diptera and Hymenoptera (Terebrantia.)*<br>*Coleoptera.* |
| 1890 | Alfred J. Nixon.... | 10 | *Land and Fresh-Water Shells.* |
| 1892 | W. E. Sharp..... | 10 | *Coleoptera.* |
| 1896 | Alfred Newstead £5 | 5s. | *Hydradephaga (Water Beetles) and Life Histories of Insects.* |
| 1897 | Alfred Newstead £5 | 5s. | *Life Histories of Insects.* |

Amounts less than £5 are also awarded annually.

## Additions to the Society's Library, 1899-1900.

### DONATIONS.

Catalogue of Californian Fossils. *Mr. J. Cooper.*
"Field," for the years 1899-1900. *Mr. H. B. Dutton.*
General Index to Miss Ormerod's Report on "Injurious Insects," 1877-1898. *Mr. R. Newstead, Curator.*
Journal of the Northamptonshire Natural History Society. *Mr. Thos. Shepheard.*
Leaflets of the British Association for the Advancement of Science.
The Naturalists' Journal, for the year 1900. *Mr. Brocton Tomlin.*
Pamphlet (Description of a New Geological Map). *Mr. G. H. Morton, F.G.S.*
Ten Pamphlets (chiefly French).
Smithsonian Report, 1897.
Transactions of the Entomological Society of London.

### BY EXCHANGE.

Cardiff Naturalists' Society, years 1898-99.
Farm Industries of Cape Colony.
Missouri Botanical Garden.
Proceedings of the Liverpool Geologists' Association.
" " Geologists' Association, 1899-1900.
" " Bristol Naturalists' Society.
" " Literary and Philosophical Society, 1898-99.
Report and Proceedings of the Manchester Field Naturalists' and Archæologist Society.
" of the Nottingham Naturalists' Society.
" " British Association for the Advancement of Science, 1899.
Transactions of the Manchester Geological Society.
" " Wisconsin Academy of Sciences, 1896-97-98.
United States Geological Survey, 1897-98-99.

### BY PURCHASE.

"Birds of Cheshire," by Messrs. Coward and Chas. Oldham.
"Naturalist," for the years 1899-1900.
"Naturalists' Journal," 1899-1900.
Palæontographical Society's Proceedings, 1899.
"Zoologist," for the years 1899-1900.

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## SOCIETIES ASSOCIATED,

### WITH WHICH THE SOCIETY EXCHANGES PUBLICATIONS.

Academia Nacional de Ciencias de la Republica Argentina, Cordoba.
Barrow Naturalists' Field Club.
Brighton and Sussex Natural History Society.
Bristol Naturalists' Society.
British Association (Corresponding Society's Committee).
British Museum (Natural History), Cromwell Road, London, S.W.
Burnley Literary and Scientific Club.
Cardiff Naturalists' Society.
Cassel Society of Natural Science.
Dudley and Midland Geological and Scientific Society and Field Club.
Epping Forest and County of Essex Naturalists' Field Club.
Glasgow Natural History Society.
Hertfordshire Natural History Society and Field Club.
Huddersfield Naturalists' Society.
La Société d'Histoire Naturelle de St. Wladimir á Kiew, Russie.
Leeds Naturalists' Club.
Liverpool Geological Society.
Liverpool Geological Association.
Liverpool Literary and Philosophical Society.
Liverpool Microscopical Society.
Liverpool Naturalists' Field Club.
Liverpool Science Students' Association.
Manchester Field Naturalists' Society.
Manchester Geological Society.
Manchester Microscopical Society.
Menai Society of Natural Science.
Northampton Natural History and Field Club.
North Staffordshire Naturalists' Field Club and Archæological Society.
Norwich Science Gossip Club.
Nottingham Naturalists' Society.
Patent Office Library, 25, Southampton Buildings, Chancery Lane, London, W.C.
Postal Microscopical Society.
Quekett Microscopical Society.
Smithsonian Institution, Washington, D.C.
The Missouri Botanical Garden, St. Louis, U.S.A.
United States Geological Survey.
Vatican Observatory, Rome.
Vienna Natural History Museum.
Wigan Literary and Scientific Society.
Yorkshire Naturalists' Union, Leeds.

# HONORARY MEMBERS.

*Those marked (*) have read or contributed Papers at the Society's Meetings.*

*Avebury, The Right Hon. Lord, F.R.S. ...*Down, Farnborough, Kent*
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Barrett, Chas. G., Esq., F.E.S. .....*39, Linden Grove, Nunhead, London, S.E.*
Candolle, Mons. Casimir De.....*Geneva*
Cannizaro, Prof. .....*Rome*
*Carruthers, W., Esq., F.R.S. .....*The British Museum, South Kensington, London, S.W.*
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*Grindon, Leo H., Esq. .....*20, Cecil Street, Greenheys, Manchester*
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*Hughes, Prof. T. McKenny, F.R.S. .....*Trinity College, Cambridge*
*Hull, Prof., F.R.S. .....*20, Arundel Gardens, London, W.*
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Renard, The Abbé .....*Curator of the Royal Museum of Natural History, Brussels*
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Roscoe, Sir Henry E., F.R.S. .....*10, Bramham Garden, London, S.W.*
*Rudler, F. W., Esq., F.G.S. .....*Museum of Practical Geology, Jermyn street, London, S.W.*
Sanderson, Dr. Burden, F.R.S. .....*64, Banbury road, Oxford*
*Sorby, Dr., F.R.S. .....*Bromfield, Sheffield*
*Vize, Rev. J. E., M.A. .....*Forden Vicarage, Welshpool*
Wallace, Dr. A. Russell, F.R.S. .....*Parkstone, Dorset*

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Williams, Mr. J. Lloyd, B.Sc.....*University College of North Wales, Bangor*

# NOTICE.

☞ **THE ANNUAL SUBSCRIPTIONS are due on the 1st of May in each year. Members who have not paid for the present year are respectfully requested to forward the amount (Five Shillings) to the Hon. Treasurer, Mr. JOHN SIMON, Chemist, 4, Eastgate Row.**

*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their Names are retained on the Society's Books, and their Subscriptions considered due, until notice has been given to the contrary, according to Rule* 8.

# LIST OF MEMBERS.

*Those marked* (*) *have read or contributed Papers at the Society's Meetings.*

Ackerley, Miss .....4 St. John's view, Handbridge
Acton, Mrs. .....Grove road, Wrexham
Adair, Major-General .....7 Stanley place
Adams, Mr. Beresford .....Shirley House, Liverpool road
Adams, Mrs. ..... ,, ,,
Adams, Mr. Harry ..... ,, ,,
Adams, Mr. Geo. F. .....Ashbourne, Victoria road
Ainsworth, Miss F. .....4 Nicholas street
*Allen, Mr. Percy K. .....21 Curzon park
Amos, Mr. Francis .....Bank of Liverpool, 2 St. Werburgh street
Andrew, Mr. John R. .....18 Bold square
Andrew, Miss R. ..... ,, ,,
*Arkle, Mr. J. .....Diocesan School, George street
Armstrong, Mr. Andrew.....15 Victoria road
Armstrong, Mrs. ..... ,, ,,
Arnold, Rev. C. L. .....Tattenhall
Arnott, Miss .....3 Exton park
Atkin, Mr. Chas. .....Hoole Council Office, Hoole
Atkin, Mrs. ..... ,, ,,

Bailey, Mr. H. Grant .....Crypt Chambers
Baillie, Mrs. E. J. .....Woodbine, Upton
Baillie, Mr. Edmund ..... ,, ,,
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Bairstow, Mrs. ..... ,, ,,
Baker, Miss .....2 Grey friars
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*Ballard, Mr. E. G., A.R.S.M. ..Newton, Chester
Barber, Mr. John .....19 Eastgate street
Barbour, Mr. Geo., J.P. .....Bolesworth Castle, Tattenhall
Barbour, Mrs. ..... ,, ,, ,,
Barnes, Mr. N. F. .....Eaton Gardens, Chester
Barnes, Rev. F., B.A. .....Hope Villa, Raymond street
Bassett, Miss C. E. .....68 Northgate street
Bax, Mr. P. B. Ironside .....6 Stanley place

Bax, Mr. Henry J. .....27 Raymond Street
Bax, Mrs. ..... " "
Baxter, Mr. Geo. .....18 The Groves
Beckett, Mr. F. J. .....Queen's park
Beckett, Mrs..... " "
*Bedford, Rev. J. L., M.A., F.L.S...10 Abbey Square
Bedford, Mrs. ..... " "
Bell, Miss Lilian Russell.....St. Sunniva, Mayfield Road, Wallasey
Best, Rev. J. D., M.A. .....Diocesan Training College
Beswick, Mr. H. .....Sunny Bank, Queen's Park
Birch, Mr. H. J. .....Corville, Liverpool Road
Birch, Miss.....18 Upper Northgate Street
Bithell, Mr. W.....Messrs. Beckett & Co., Eastgate Row
Blake, Miss .....Watergate Row
Blayney, Mr. A. .....2 City Walls, W.
*Blogg, Rev. H. B., M.A. .....Frodsham Vicarage, Cheshire
Blomfield, Admiral ..... { c/o Messrs Woodhead & Co., 44 Charing Cross, London
Blower, Mr. T. B. .....6 The Groves
Boden, Mr. Robt. W.....Saighton Lodge, Chester
Bolland, Mrs.....23 Hough Green
Bolland, Mr. Frank ..... " "
Bonnalie, Mr. G. S., L.D.S., R.C.S...Upton park, Chester
Bonnalie, Mrs. ..... " "
*Bonnalie, Mr. Fredk. J., L.D.S., R.C.S...4 Abbey Square
Bonnalie, Mrs. ..... " "
Booley, Miss .....74 Bouverie street
Bourne, Mrs.....Golden grove, Hoole
Bowers, Mr. H. R., J.P.....2 Richmond Place
Bowers, Mrs. ..... " "
Bowers, Miss M. .....35 Liverpool Road
Bowles, Mr. T. S. .....13 Hough Green
Bowyer, Miss Edith .....5 Crane Street
Box, Mr. Henry.....46 Frodsham Street
Boyson, Miss Annie H. ..... { 28 Macaulay road, Clapham Common, London, S.W.
Bradbury, Mr. R. P. .....Walmore, Dee banks
Bramall, Mr. G. H. .....4 Nicholas Street
Brassey, Miss.....Rose Hill, Bowdon, Cheshire
Brassey, Mr. Herbert .....TheLimes, Curzon park
Brassey, Mrs..... " "
Brewer, Miss E. .....15 Paradise row
Brewer, Miss Anne ..... " "
Bridge, Dr. J. C., M.A. .....Christ Church Vicarage
Bridge, Mrs. ..... " "
Bridge, Miss ..... " "
*Broadbent, Mrs. .....Bache Cottage
Brooks, Mr. J. B. .....The Hawthorns, Hough Green
Brown, Miss L. E. .....The Folly, Flookersbrook
*Brown, Mr. F. F., M.A. .....Eastgate row
Brown, Miss .....61 Bouverie street
Brown, Miss Daisy ..... " "
Brown, Mr. W. E. .....33 Parkgate Road
Brown, Mrs. ..... " "
Brown, Mrs. H. T. .....Roodeye House, Chester
*Buckler, Rev. J. F., M.A. .....Bidston Rectory, near Birkenhead
Buckley, Mr. Wm. Ireland, F.R.G.S...Weaver View, Winsford, Cheshire
Bullin, Mr. F., L.D.S., R.C.S., J.P...20 Nicholas Street
Bullin, Mrs. ..... " "
Bullin, Miss E. ..... " "
Bull, Mr. H. F.....4 Sunny Bank, Queen's Park
Bull, Mrs. ..... " "

Burrell, Mr. T. G. ..... 119 Foregate street
Burrows, Mr. R. ..... Railway Inn, Brook street
Burness, Mr. Wm. ..... Parr's Bank, Ltd., Chester
Burnett, Miss Eleanor ..... 27 South Road, Devonshire Park, Birkenhead
Butcher, Mr. Jas. ..... 20 The Groves
Butterworth, Mr. Robt. ..... 19 Bouverie street
Butler, Mr. A. ..... Eversley park

Caldecott, Miss C. G. ..... 19 Pepper street
Campbell, Mrs. Pitcairn ..... Vicar's Cross, Chester
Campbell, Mr. A. D. Pitcairn .. " "
Caröe, Miss ..... The Gables, Flookersbrook
Carr, The Hon. Mrs. ..... 131 Boughton
Carr, Mrs. Thos. ..... Fuller's Moor, Broxton
Carter, Mr. T. ..... Chemist, Boughton
Cartwright, Mr. J. P. ..... Pool House, Flookersbrook
Challinor, Mr. R. ..... 32 Eaton Road
Chalton, Mr. T. W. ..... Wynstay, Hoole, Chester
Chalton, Mrs. ..... " "
Chapman, Mr. F. W. ..... 42 Tarvin Road
*Chester, The Right Rev. The Lord Bishop of } The Palace, Dee Side
Churton, Mrs. G. ..... 92 Watergate flags
Clark, Mr. Sidney ..... Upton Villa
Clark, Miss Sybil ..... Stanley House
Clarke, Mr. John ..... Pasadena, Liverpool Road
Clarke, Mr. W. J. ..... The Beeches, Upton park
Clare, Mr. Horatio ..... Grosvenor Schools, Chester
Clemence, Mr. S. ..... 2 Chichester street
Clemence, Mr. Thos. ..... Rockend, 31 Cambrian view
Clough, Mr. G. F. ..... 2 Hough green
Clough, Mrs. ..... " "
Cockrill, Mr. C. P. ..... Chester road, Saltney
Cockrill, Mrs. ..... " "
Coe, Mr. D. ..... 26 Lightfoot street
Coe, Mr. Henry J. ..... 4 Bold terrace
Collinge, Mr. James ..... Kinnerton Lodge, Chester
Coltart, Mr. C. B. ..... Wisbeach House, Glan Aber park
Connah, Mr. Jas. ..... } Government Laboratory, Clement's Inn Passage, London, W.C.
Conway, Mr. Walter ..... 8 and 10 Old Bank buildings
Cook, Mr. G. Mark ..... 13 Brook street
Cooke, Mr. J. H. ..... 6 Queen street
Coppack, Mr. Chas. ..... Gladwyn, Liverpool road
Coppack, Miss ..... " "
Coppack, Miss Nellie ..... " "
Cordery, Miss C. ..... St. Agnes' School, Caldy, West Kirby
Crum, Mr. W. G., J.P. ..... Thornliebank, Glasgow
Cullimore, Mrs. ..... Christleton, Chester
Cummings, Miss A. F. ..... King's buildings
Cummings, Miss Beatrice ..... " "

*Darby, Very Rev. J. L., D.D. .. The Deanery
Darby, Mrs. ..... "
Darby, Miss ..... "
Darby, Mr. Alfred ..... Wren's Nest, Wrexham
Davies, Miss Henrietta ..... 69 Boughton
Davies, Mr. E. Henry ..... 19 Francis street
Davies, Mr. Joseph ..... " "
Davies, Mr. John ..... Parr's Bank, Limited, Chester
Davies, Mr. J. P. ..... 75 Crane street
Davies, Miss ..... St. Michael's School
Davies, Miss Nessie ..... Old Hall, Helsby

Davies, Mr. W. L. .....Beechwood House, Canal street
Davies, Mrs. ..... " " "
Davison, Mr. Herbert .....Brookside, Flookersbrook "
Davison, Mrs. ..... " "
Day, Mr. John .....Bryntirion, Chichester street
Day, Mrs. ..... " " "
Day, Mr. George .....Eastgate street
Dean, Mr. J. T. .....8 Abbey street
Delany, Mr. John .....7 Lorne street (South)
Delany, Mrs. ..... "
Dennis, Miss Ada.....47 Nicholas street
Denson, Mr. W. .....21 Upper Northgate street
Denson, Mrs. ..... " "
Denson, Miss Adelaide ..... " "
Denson, Mr. J. Lyon ..... " "
Denson, Mr. W. H. .....3 Abbey green
Denson, Mrs. ..... " "
Dickinson, Mr. D. .....1 Upton view, Hoole
Dickson, Mr. Geo. A., J.P. ....Springfield, Flookersbrook
Dickson, Mr. J. H. ..... .....Clifton House, Grosvenor street
Dickson, Mrs. ..... " "
Dickson, Miss .....Upton House, Chester
Digby, Miss .....2 Grey Friars
Digweed, Mr. Chas. S. .....39 Beaconsfield street
*Dobie, Dr. W. M., F.R.A.S., J.P...Northgate House
Dobie, Miss Mabel ..... " "
Dobie, Miss Mildred ..... " "
*Dobie, Mr. W. H., M.B. .....Hunter street
Dobie, Mrs. ..... " "
*Dobie, Dr. Herbert .....11 St. John street
Dobie, Mrs. ..... " "
Dobie, Mr. Douglas .....Upper Northgate street
Dobson, Mr. R. .....39 Cotgreave Terrace
Dod, Rev. C. Wolley, M.A., J.P...Edge Hall, Malpas
Dod, Miss Wolley..... " "
Dodd, Mr. W. .....143 St. Anne street
Dodd, Mr. John .....35 Saughall road
Donald, Mrs. .....The Cross, Chester
Donne, Mrs. .....6 Chichester street
Donne, Miss ..... " "
Dowdall, Lieut.-Col. A. P. .....Curzon park
Dowdall, Miss A. ..... " "
Drinkwater, Dr. .....Wrexham
Ducker, Mr. P. J. .....George street
Duckworth, Mr. Henry, F.L.S. F.G.S...Liverpool road
Duckworth, Miss M. E. Theodora..38 Liverpool road
Duff, Dr. .....5 Abbey street
Dutton, Mr. George, J.P. .....Curzon House
Dutton, Mrs. ..... "
Dutton, Mrs. G. W. .....The Cottage, Ashton Hayes
Dutton, Mr. H. B. .....Freshfield, 27 Curzon Park
Dutton, Mrs. ..... " "
Dutton, Mr. Hugh T. ..... " "
Dutton, Miss M. .....4 Park street
Dutton, Mr. J. Rowe .....The Beeches, Saltney
Dutton, Mr. J. F. Harrison ....The Nook, Hamilton street, Hoole
Dutton, Mr. A. E. .....55 Frodsham street
Dye, Mr. Alfred B. .....72 Bouverie street
Dye, Miss Ethel ..... " "
Du Puget, Mrs. Michod .....Fernville, Curzon park

Edwards, Mr. F. G., M.R.C.V.S...5 Newgate street
Eggers, Miss ..... ....21 Hough green

Egginton, Mr. R. H. .....12 King street
Egginton, Mrs. ..... " "
Elliott, Dr. John, B.S., B.Sc. ..24 Nicholas street
Elliott, Miss ..... " "
Ellis, Mr. R. J. .....60 Foregate street
Evans-Lloyd, Col., J.P. .....Stanley House
*Evans, Mr. F. .....The Eastgate
Evans, Mr. Geo. H. .....The Limes, Lumley road
Evans, Miss .....Roseneath, Wrexham
Ewing, Mr. C. A. .....3 Brookside villas, Flookersbrook

Farmer, Mr. Richard .....36 Liverpool road
Farrimond, Mr. F. T. .....Sunnyside, Boughton
Fergusson, Mr. W. .....The Cairn, Liverpool road
Fergusson, Miss J. M. ..... " "
Ffoulkes, His Honour Judge Wynne, M.A...Old Northgate House
Ffoulkes, Mr. Thomas B., Junr...8 Burlington road, Ipswich
Ffoulkes, Mr. Geo. B. .....15 Chichester street
Finchett-Maddock, Mrs. H. ....Cae Gwyn, Carnarvon
Firman, Rev. Septimus .....44 Great Mersey street, Liverpool
Fish, Mrs. .....Arnold House, Parkgate road
*Fish, Rev. A. H., B.A., B.Sc. .. " "
Fisher, Rev. O. P. .....74 Bouverie street
Fleet, Mr. H. .....35 Tarvin road
Fleming, Mr. T. R. .....Rowton Grange
Fleming, Mrs. ..... " "
*Fletcher, Mr. P. H. .....Woodbrae, Curzon park
Fletcher, Miss ..... " "
Float, Mrs. S. M. .....20 Upper Northgate street
Fluitt, Miss .....42 Upper Northgate street
Footner, Mrs. .....Dee banks
Forster, Mr. W. Angus .....Belgrave Lodge, Pulford
Fraser, Colonel .....Kingsley Lodge, Liverpool road
Fraser, Mrs. ..... " " "
Fraser, Mr. A. R. .....Rowton
Frater, Mr. Jas. .....Stone Villa, Stone Bridge
Frater, Mrs. ..... " "
Frater, Mr. Geo. .....Lloyds Bank, Wrexham
Frater, Mrs. ..... " "
Freeman, Mr. C. E. .....Grange road, Brook lane
Freeman, Mrs. ..... " "
Frisby, Miss .....8 Chichester street
Frost, Sir Thomas G., J.P. .....Redcliff, Queen's park
Frost, Lady ..... " "
Frost, Mr. J. G., J.P. .....Boughton Hall
Frost, Mrs. ..... " "
Frost, Mr. J. M., J.P. .....Dee Lodge
Frost, Mrs. ..... " "
Frost, Mr. T. Gibbons .....Mollington Banastre
Frost, Mrs. ..... " "

Gardiner, Miss .....23 Liverpool road
Gardner, Miss Monica F. .....33 Cambrian view
Gardner, Mr. E. .....9 Abbey street
Garner, Mr. T. .....61 Catherine street, Sealand road
Garnett, Mrs. .....The Rectory, Christleton
Garnett, Mr. .....Glasfryn, Llanfairfechan
Garnett, Mrs. ..... " "
Garside, Mr. Franklin .....14 Bouverie street
Garside, Miss Ethel ..... " "
Gerrard, Miss .....Fuller's Moor, Broxton

Gibson, Major .....Buckley, *via* Chester
Gibson, Miss .....5 Crane street
Gibson, Mr. John .....Wisbeach House, Glan Aber park
Giffen, Mr. J. T. M., F.R.C.S...Richmond Hill, Boughton
Gilbert, Mr. Egerton .....17 Eaton road
Gilbert, Mrs. ..... ,, ,,
Giles, Mr. E. S. .....Gowymede, Vicar's Cross
Giles, Mrs. ..... ,, ,,
Glascodyne, Miss .....4 King's Buildings
Golder, Mr. S. .....41 Liverpool road
Golder, Mr. Jas. T. .....34 Eaton road
*Goodman, Mr. A. E. .....Oakdene, Tarvin road
Goodman, Mrs. ..... ,, ,,
Goodhart, Mrs. E. S. .....96 Watergate flags
Gore, Ven. Archdeacon .....Bowdon, Cheshire
*Granger, Mr. F. M., M.R.C.S., L.R.C.P...18 Nicholas street
Granger, Mrs. ..... ,, ,,
Grantham, Rev. H. .....S. Mary's Rectory
Gray, Miss .....4 Lorne street
Greenhouse, Mr. Chas.....1 Eversley park
Greig, Mrs. .....5 Victoria pathway, Queen's park
Griffith, Mr. G. R. .....Grosvenor street
Griffith, Mr. G. B. .....22 Queen street
Griffith, Mr. T. H.....35 Egerton street
Griffith, Mr. W. R. .....Rydal Mount, Upper Bangor
Griffiths, Miss .....2 Holly Bank, Queen's park
Griffiths, Mr. John ..... ,, ,,
*Griffiths, Rev. T. T., M.A. .... ,, ,,
Griffiths, Mr. W. M. .....West Hey, 40 Hough green
Griffiths, Miss .....88 St. Anne street
Grindley, Mr. J.....3 Eastgate street
Gunton, Miss.....Rimmersfield

Haddacks, Mr. C. R. .....6 Ash grove
Haddacks, Miss Elizabeth ..... ,, ,,
Hallmark, Mr. J. B.....Melville, Hoole road
Hamilton, Mr. A., M.R.C.S.....16 White Friars
Hamilton, Mrs. ..... ,, ,,
Hampson, Mr. R.....Halkyn road, Flookersbrook
Hardy, Mr. J. E. .....The Blue Coat School
Harris, Mr. T. .....Dee Hills park
Harris, Mrs. ..... ,, ,,
Harrison, Mr. N. .....Highfield, Curzon park
Harrison, Mrs. ..... ,, ,,
Haswell, Mr. G. H. .....Queen's park
Haswell, Mrs..... ,, ,,
Haswell, Mr. W. H. .....84 Foregate street
Haswell, Mr. J. F. ..... ,, ,,
Hawkins, Mr. J. M.....Glan Aber park
Heeley, Miss .....3 Cheyney road
Henderson, Mr. J. E. .....19 Pathway, Queen's park
Henshall, Mr. James, Junr.....Bouverie street
Henshaw, Mr. T. .....The Hollies, Liverpool road
Henshaw, Miss Florence M. .... ,, ,,
Heppel, Miss .....8 Hough green
Heppel, Mrs.....Windsor Lodge, Mickle Trafford
Hervey, Rev. Thos. Manners W..Raymond street
*Hetherington, Mr. T. .....George street
Hewitt, Mr. David L. .....Abbey House, Northgate street
Hickey, Mrs. .....2 Victoria pathway, Queen's park
Hickman, Mr. F. F.....8 Northgate street
Higgins, Miss Eva .....The Manor, Overleigh
Higgins, Miss Millie..... ,, ,,

Higginson, Mr. T.....1 South view, Eaton road
Hignett, Mrs.....14 Hough green
Hignett, Mr. A. H. ..... " "
Hignett, Mrs. T. H.....Shandon, Hough green
Hilton, Mrs. .....Talbot Hotel
*Hilton, Mr. Rob. .....S. Mary's Cottage, Chester
Hincks, Mr. J. W.....Brantwood, Brook lane
Hincks, Mrs..... " "
Hindhaugh, Mrs. .....Parkgate road
Hobday, Mr. J. .....Alexandra Villa, Liverpool road
Hobday, Mr. E. ..... " "
Hobday, Mr. Jas., M.B., B.A. ..49, Upper Bedford place, Russell Square, London, W. C.
Hodge, Mr. J. R.....23 Liverpool road
Hodge, Mrs. ..... " "
Hodge, Mr. E. G..... " "
Hodge, Miss Constance ..... " "
*Hodges, Mr. W. .....31 Hough green
Hodkinson, Mrs.....39 White Friars
Hodkinson, Mr. E. ..... " "
Holding, Mr. Geo. .....5 Belgrave street, Liscard, Cheshire
Holland, Miss .....11 Derby place, Hoole road
Holme, Rev. Canon, M.A.....Great Budworth, Northwich
Holmes, Mr. J. G., J.P. .....Belmont, Curzon park
Home, Miss R. .....1 Lumley road
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopley, Mr. J. H.....6 Northgate street
Hopton, Mrs.....6 Cheyney road
Hopwood, Miss .....The Deanery
Hornby, Mr. Alex. .....Wood Villa, Brook lane
Hornby, Mrs..... " "
Horner, Mr. W. .....9 Blacon Terrace, Saughall road
Hostage, Mr. George B.....28 Eaton road
Hostage, Mrs. ..... " "
Hostage, Miss .....22 Eaton road
Howson, Rev. J. F., M.A.....Egerton House, Upper Northgate street
Howson, Miss ..... " "
Howson, Rev. G. J., M.A.....Christ Church Vicarage, Crewe
Howe, Rev. W. N. .....43 White Friars
Hudson, Mrs. R. S. .....Bache Hall, Chester
Hughes, Mrs. McKenny .....18 Hills road, Cambridge
Hughes, Mrs. Tom .....17 Hyde Park square, London, W.
Hughes, Mr. John .....47 Victoria street, Westminster, London
Humberston, Miss .....Newton Hall, Chester
Humphreys, Mr. E. Noel .....Caer y Cael, Hoole
Humphreys, Mrs. ..... " "
Humphreys, Miss Lilian .....5 Hamilton street, Hoole
Hunter, Mr. Jas. .....Maisonette, Hough green
Hunter, Mrs. ..... " "
Hunter, Mr. Jas. De Graaff..... " "
Hutchings, Mr. J. H., Senr. ....47 White Friars
Hutchings, Mr. J. Hanmer.....Tudor Lodge, 150 Boughton
Hutchings, Mrs. ..... " "
Hutchinson, Mr. Thos.....48 Frodsham street
Hutton, Rev. E. A., M.A.....Hargrave Vicarage, Chester
Huxley, Miss M. E. .....41 Cheyney road
Huxley, Miss Ann..... " "

Jack, Mr. A. S.....Belle Vue, 36 Hough green
Jackson, Mr. Roger, J.P. .....26 Hough green
Jackson, Miss ..... " "
Jackson, Mr. Robert .....8 Denbigh street
James, Rev. T. D. .....Athol House, Brook lane

*Jebb, Mr. G. R., C.E. ..... Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S. } 13 Lorne street (North)
Jepson, Mr. Arthur ..... 6 Walpole street
Johnson, Major ..... 2 White Friars
Johnson, Mrs. ..... 11 Bertram road, Sefton park, Liverpool
*Johnson, Mr. M., L.D.S.I. ..... 9 York villas, Lorne street
Johnson, Mr. Thomas C. ..... Bod Asaph, Chichester street
Johnson, Mr. Noel ..... Warwick Road Hall, Bowdon
Jolliffe, Mr. H. D. ..... Queen's park
Jones, Miss ..... The Northgate
Jones, Mrs. Edward ..... 1 Derby place, Hoole
Jones, Mr. Jno. ..... 5 Lorne street (North)
Jones, Mr. David Brellisford ..... 11 St. Anne street
Jones, Rev. D. Treborth ..... Eryl, Hoole road
Jones, Mr. W. S. ..... North & South Wales Bank
Jones, Mr. Owen E., J.P. ..... Tynrheol, Amlwch
Jones, Mr. Fred. ..... 26 Frodsham street
Jones, Mr. H., A.C.A. ..... 14 Lord street
Jones, Miss ..... 2 Hunter street
Jones, Mrs. W. H. ..... 4 Abbey street
Jones, Miss F. Bannister ..... " "
Jones, Mrs. Evan ..... Bodrenig, Bala, N. Wales
Jones, Mrs. Selvia M. ..... 35 Upper Northgate street
Jones, Mr. W. A. ..... Canal street
Jones, Mrs. Wm. ..... Cuppin street
Joyce, Rev. G. C., M.A. ..... St. Deiniol's Hostel, Hawarden
Joyce, Rev. F. Hayward ..... 9 Abbey square
Joyce, Miss Laura ..... " "
Joyce, Miss Eldela ..... " "

Kelsall, Miss H. ..... Abbot's Court, Liverpool road
Kenyon, Mr. G. A., M.B. ..... Flookersbrook
Kenyon, Mrs. ..... "
Killick, Mr. George ..... Eaton, Chester
King, Dr. H. W. ..... 26 Nicholas street
King, Mrs. ..... " "
King, Mr. Fred. F. ..... 7 Bold square
*Kingsley, Miss ..... Keys, Eversley, Winchfield
Knight, Mr. ..... Rhianfa, Bull Bay, Amlwch
Knight, Mrs. ..... " " "
Knight, Miss ..... 8 Eastgate Row
Knowles, Mr. E. R. ..... Grosvenor street
Kynnersley, Mr. E. M. Sneyd .. Boughton Lodge

Lacy, Mrs. ..... Moore Holme, Neston
Laing, Miss S. C. ..... 7 Chester street, Saltney
Lamont, Mr. A. ..... 3 City Walls (West)
Lamont, Mr. A., Junr. ..... " "
Lamont, Miss ..... " "
Lanceley, Mr. R. H. ..... Victoria road
Latham, Mr. J. S. ..... Green bank, Liverpool road
*Lawrence, Dr. A. ..... The Asylum, Chester
Leader, Miss ..... 4 King's buildings
Ledsham, Mr. Wm. ..... Coal Exchange
Lee, Miss Pattie ..... Cop House, Saltney, Chester
Lees, Mr. W., M.R.C.S. ..... The Bars
Leete, Mrs. ..... Vicarage road, Hoole
Leete, Miss ..... Talbot Hotel
Lewis, Rev. J. S., M.A. ..... Newtown Rectory, Mont.
Little, Mr. W. E. ..... 24 Hough green
Littler, Miss ..... 132 Overleigh road, Handbridge
Lloyd, His Honour Sir Horatio .. Stanley Place

*LLoyd, Colonel Wilford .....Eccleston Hill, Chester
LLoyd, Mrs. ..... ,, ,,
Lloyd, Miss M. E. .....13 Chichester street
Lloyd, Miss C. .....56 Princess street
Lockwood, Mrs. .....7 Queen's park
Long, Mrs. .....11 Lumley road
Long, Miss ..... ,, ,,
Long, Miss F. ..... ,, ,,
*Longbottom, Mr. F. W. .....Haslemere, Queen's park
Longbottom, Mrs ..... ,, ,,
Lovell, Mr. A. E., M.A.....75 Bouverie street
Lovell, Mrs. ..... ,, ,,
Lowe, Miss C. H. .....25 Hough green
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. } 9 Hough green
Lowe, Mrs..... ,, ,,
Lowe, Mr. Jas. F., B.A. .....Dee banks
Lowry, Mr. E. D. .....Queen's park
Lowry, Mrs. ..... ,, ,,
Lowndes, Miss D. Lily.....Fairfield, Wallasey
*Lucas, Mr. A. W., F.G.S. .....7 Victoria pathway, Queen's park
Lumby, Mr. Arthur H. .....17 George street
Lund, Mr. R. S. .....24 St. John street
Lutener, Rev. Wm. .....Beech Holme, 8 Curzon park

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Mr. G. E. ..... ,, ,,
*Macdonald, Miss Eva ..... ,, ,,
Maddocks, Mr. Frank .....Riverlea, Dee Banks
Manley, Mr. H. .....Aston, Nantwich
Mann, Mr. A., M.B. .....Newgate street
Mann, Mrs. ..... ,, ,,
*Manning, Mr. J. B. .....27 Perryn road, East Acton, London, W.
Manning, Miss Edith .....18 Upper Northgate street
Marriott, Mr. J. W. .....The Grosvenor Museum
Marsden, Miss .....6 Grosvenor park road
Marston, Mr. Chas. .....11 Victoria Terrace, Mold
Mason, Mr. F. B. .....1 Exton park
Mason, Mrs. ..... ,, ,,
Mason Mr. J. Clarkson .....8 Moss Bank, Parkgate road
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
McCulloch, Mr. A. M.....Lime Grove
McCulloch, Mrs. ..... ,, ,,
McEwen, Mrs. .....83 Alexandra terrace, Hoole road
*McMichael, Mr. J.A., B.A., B.Sc...39 Parkgate road
McMichael, Mrs. ..... ,, ,,
McIneray, Mr. A. J. .....1 Allington terrace, Hoole road
Meacock, Miss .....White Friars Cottage
Meacock, Miss .....9 Bridge place
Meeson, Mr. W. H. .....21 Bold square
Middleton, Mr. G. .....1 Sandown terrace
Middleton, Mrs..... ,, ,,
Mill, Miss F. .....24 Eaton road
Miller, Rev. P. A., M.A. .....The Quilletts, 6 Liverpool Road
Miller, Mrs. ..... ,, ,, ,,
Miller, Mr. Hugh .....33 Hough green
Miller, Mrs. ..... ,, ,,
Millington, Mr. C..... .....Victoria House, Victoria road
Millington, Mrs. ..... ,, ,,
Mills, Mrs. .....Derby House, Hoole
Mills, Mr. T. .....Union Hall, Foregate street
*Miln, Mr. G. P..... .....Milnholme, Brook lane
Miln, Mrs. ..... ,, ,,

Minns, Mr. Alfred.....35 St. Anne street
Minshull, Mr. E. .....The Northgate
Minshull, Mr. C. H.....Lorne street
*Mitchell, Rev. J.C., B.D., F.R.A.S...Rutland Cottage, Parkgate road
Monkhouse, Miss M. .....14 Sibell street
Montgomery, Rev. J. K. .....Abbot's villas, Liverpool road
Montgomery, Mr. John K., B.A., B.Sc..22 Lincoln place, Dublin
Moreton, Mr. T. W. E., M.R.C.S...Tarvin
Morgan, Rev. J. B. .....Hazeldene, 17 Halkyn road
Morgan, Mr. Sydney .....Malpas
*Morris, The Rev. Canon, D.D., F.S.A. } St. Gabriel's Vicarage, 4 Warwick square, London, S.W.
Morris, Mr. Gerald Case .....Upton Grange, Chester
Mosford, Mr. John .....The Righi, Tattenhall
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# Chester Society

of

# Natural Science Literature & Art.

Founded by Charles Kingsley, 1871.

## Thirtieth Annual Report and Proceedings for the Year 1900-1901.

*For Contents see Title Page.*

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# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY, 1871).

## THIRTIETH

# ANNUAL REPORT

AND

# PROCEEDINGS.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art, by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Eight Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules :—

4.—The name of any Candidate for Membership of the Society, with those of a Proposer and a Seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

7.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each—except to the Annual General Meeting, to which Members only are admitted.

8.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

9.—The names of Members whose Subscriptions are two years in arrear, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

10.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

11.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

12.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

13.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

14.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement, made up to the end of April, and duly audited, shall also be submitted, and read if desired.

15.—Nominations for the Committee and Auditors shall be sent, in writing, to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

16.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

17.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

18.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1901-1902.

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*General*—Mr. G. P. MILN, *Milnholme, Brook Lane*
*General*—Mr. W. F. J. SHEPHEARD, F.C.S., *Bridge Street Row*

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Mr. R. NEWSTEAD, F.E.S., *The Grosvenor Museum.*

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The above Officers (*Ex-officio*),

AND

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## Curator:

Mr. R. NEWSTEAD, F.E.S., *The Grosvenor Museum.*

## Assistant-Secretary:

Mr. H. NEW.

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Mr. J. D. SIDDALL
Mr. G. P. MILN
Mr. JOHN SIMON
Mr. J. BAIRSTOW, F.C.S.
Mr. G. WATMOUGH WEBSTER, F.C.S.

## HON SCIENTIFIC SECRETARY'S REPORT.

THE general condition of the Society is most flourishing and satisfactory as you will learn from the various Reports that will be presented to you. We must all deeply regret that our President is not with us to-night, and I am sure it is the hearty wish of all, that one who has guided us so well during the past three years, may soon be restored to his usual health.

There is a sad side to every record and we have to regret the loss of Mr. Alexander Lamont, one of our oldest members, who by his steady perseverance helped to build for us our present home, and was a faithful and staunch supporter of this Society. Another old and trusted member has been taken from us in Mr. P. H. Fletcher, who for many years acted as our Librarian, and as long as health permitted was a constant attendant at our Committee Meetings. A younger and still more active member of our Society has gone from us in Mr. Spencer, who, besides being the Secretary of the Photographic Section, helped forward many a struggling beginner in his own particular branch.

It is curious to see how photographic representations, by means of the electric light, have replaced almost every other mode of illustration. I think every Section of our Society uses this method of visual instruction, and I believe that even pure Art has learned to look at Nature with a truer eye through its mechanical reproduction by Photography.

Steady work has been done in all the Sections. We are slowly trying to complete the *Fauna* and *Flora* of our district. There is, however, still much to be done, and some groups have not even been touched, but are waiting for the enthusiasts who, by their love of nature, will make her yield up her secrets.

Our Curator (Mr. Newstead) has done good work during the past year, and in his Monograph on the *Coccidæ*, to be published by the Ray Society, will make for himself a name that will be honoured by all Naturalists throughout the World. We, as a Society, are fortunate still to retain his services. To the younger members who have joined and are about to join our body, no higher standard of perseverance and industry could be held out than the example of our Curator, who, amongst many difficulties, has placed himself high in the rank of Naturalists, and still retains that modesty which is the true mark of genius.

In conclusion, I trust that all the members will do their best, not only to keep alive the objects for which our Society was founded, but press on towards making the work complete.

HENRY STOLTERFOTH,
*Scientific Secretary.*

## HON. SECRETARIES' REPORT.

In presenting the 30th Annual Report, your Committee have pleasure in announcing that the past year has been one of marked prosperity for the Society.

Upwards of a hundred new Members have joined since the last Annual Meeting; and the attendances at the General and Sectional Meetings have been considerably above the average.

The increased attendances at the Excursions and Field Meetings were even more marked; and at these, many Members displayed a keen interest in Botany, Geology, and Entomology.

The Finances of the Society are also in a sound and healthy condition, as will be seen by the Hon. Treasurer's Report.

The total number of Members at present on the Society's books is as follows:—

| | |
|---|---|
| Honorary Members - - - | 28 |
| Corresponding Members - - | 21 |
| Ordinary Members - - - | 871 |
| Total - - - | 920 |

being a nett increase (after losses by withdrawals and deaths) of 51 over last year.

Twelve Committee Meetings have been held during the year. The Members of Committee have been faithful in their attendance at these; and they have also been very helpful to the Officers in carrying on the work of the Society.

There were eight Excursions held during the Summer Session, as follows:—

| | 1900. |
|---|---|
| Beeston Castle, Horsely Bath, and Peckforton Castle | May 16th |
| Burton Point | June 6th |
| Welshpool and Powis Castle (Annual Excursion) | ,, 13th |
| Old Parsonage Gardens, Gresford | ,, 20th |
| Moel Fammau and Cilcain | July 4th |
| Farndon and Holt | ,, 12th |
| Eaton Gardens | ,, 18th |
| Engineering Works of the L. & N. W. Railway at Crewe | September 19th |

Besides these, Evening Meetings were held at the following places of local interest:—

| | 1900. |
|---|---|
| Bache Hall Gardens and Pinetum | May 24th |
| Chester Cathedral | June 27th |
| Newton Hall Gardens | July 24th |

The Annual Conversazione was largely attended by Members and their friends, who displayed a keen interest in the various exhibits, a number of which were this year quite new to us—notably that of the various species of *Salmonidæ* from the Earl of Denbigh's Fish Hatcheries, at Holywell, which was kindly superintended by J. Basil Feilding, Esq.

Your Committee tender to the working members of the Paxton Society their best thanks for the helpful assistance given at the Conversazione; and also in organising the Exhibition of Spring Flowers recently held in the Museum.

During the Winter Session there were eight General Meetings and sixteen Sectional Meetings, as follows:—

## GENERAL MEETINGS.

1900.

Oct. 17th—Annual Conversazione.

Nov. 1st—"Flightless Birds"—Dr. Wigglesworth (Rainhill).

Dec. 6th—"Above the Snow Line"—Rev. Frank James, M.A. (Rossett).

1901.

Jan. 10th—"Up in a Balloon"—Miss Gertrude Bacon (of Newbury).

Feb. 7th—"The Seine, from Rouen to Paris"—Rev. W. N. Howe, M.A.

,, 28th—"Some Recent Discoveries, and their bearing on the Constitution of Matter"—Rev. A. H. Fish, B.A., B.Sc.

Mar. 7th—"The Nose": A Guardian of Health—Dr. J. T. Roberts.

The above Lectures were illustrated by Lantern Slides, &c.

Apr. 25th—Exhibition of Spring Flowers, by
Members of the Chester Paxton Society and others.

## SECTIONAL MEETINGS.

### BOTANICAL.

1901.

Jan. 17th—"Notes on the Flora of Wirral," by
Dr. C. Theodore Green (Birkenhead).

### ZOOLOGICAL.

1901.

Mar. 21st—"Ornithological Notes," by Dr. W. Henry Dobie.
"Entomological Notes," by
Dr. Herbert Dobie and Mr. J. Arkle.
"A Problem in Distribution," by Mr. Chas. Oldham.
"Notes from my Diary," by Mr. R. Newstead, F.E.S.

Apr 11th—"Personal Observations on Insect Life," by Mr. J. Arkle.

## GEOLOGICAL.

1900.
Nov. 8th—"Notes on the Geology of the North Coast of Anglesey," by THE PRESIDENT (MR. J. D. SIDDALL).

1901.
Mar. 28th—"The Conditions represented by the Lower Keuper" (our Local Red Sandstone), by MR. HENRY C. BEASLEY (Hon. Sec. Liverpool Geological Society).
"The Permo-Carboniferous Boundary," by MR. W. J. CLARKE.

## NATURAL PHILOSOPHY.

1900.
Oct. 25th—"Ancient and Modern Theories of Matter," by MR. H. J. BAX.

1901.
Feb. 14th "The Eye as an Instrument of Vision," by MR. FOSTER SMITH, B.Sc. (Holywell).

Apr. 18th—"Electric Car Systems compared," by MR. J. A. MCMICHAEL, B.Sc.

## MICROSCOPICAL.

1900.
Nov. 15th—"Methods of Photo-Micrography," by MR. A. E. GOODMAN.

## PHOTOGRAPHIC.

1900.
Nov. 22nd—"Pictorial Photography," by MR. W. SCHRÖDER, A.R.C.A.

Dec. 17th—Exhibition of the "Amateur Photographer" 1900 Prize Lantern Slides.

1901.
Feb. 21st—Exhibition of 1900 Prize Slides, kindly lent by the EDITOR OF *Photography*.

## LITERATURE.

1900.
Dec. 13th—"Charlotte Brontë," by MISS MONTGOMERY, B A.

## ASTRONOMICAL.

1900.
Nov. 29th—"The Total Solar Eclipse of May, 1900; A Mediterranean Holiday," by MR. F. W. LONGBOTTOM, M.B.A.A.

1901.
Mar. 14th—"The Lesser Light—The Moon: her History and her Scenery," By DR. WHICHELLO.

NOTE.—Most of the above Sectional Meetings were suitably illustrated by Lantern Slides, &c.

## ART.

1900.
Oct. 17th (Open for 1 month). A Special Exhibition of Oil and Water-Colour Paintings, by Artists resident in the District, Members of the Guild of Arts and Crafts.

G. P. MILN,
W. F. J. SHEPHEARD, } *Hon. Gen. Secretaries.*

MAY 2ND, 1901.

# The Hon. Treasurer in account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1901.

| Dr. | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| 1900-1901. | | | | | | |
| By Balance from last Account .. .. | | | | 23 | 10 | 0 |
| ,, 777 Subscriptions for 1900-1901 @ 5/- .. | 194 | 5 | 0 | | | |
| ,, 42 ,, Arrears 1899-1900 @ 5/- .. | 10 | 10 | 0 | | | |
| ,, 8 ,, ,, 1898-1899 @ 5/- .. | 2 | 0 | 0 | | | |
| ,, 2 ,, ,, 1897-1898 @ 5/- .. | 0 | 10 | 0 | | | |
| ,, 1 ,, ,, 1896-1897 @ 5/- .. | 0 | 5 | 0 | | | |
| | | | | 207 | 10 | 0 |
| ,, Gross Receipts from Excursions— | | | | | | |
| To Beeston Castle .. .. .. | 9 | 13 | 1 | | | |
| ,, Burton Point .. .. .. | 1 | 13 | 9 | | | |
| ,, Powis Castle .. .. .. | 10 | 19 | 0 | | | |
| ,, Dr. Mules, Gresford .. .. | 3 | 5 | 10½ | | | |
| ,, Moel Fammau .. .. .. | 7 | 4 | 0 | | | |
| ,, Farndon Hall .. .. .. | 6 | 5 | 6 | | | |
| ,, Eaton Hall Gardens .. .. | 3 | 1 | 6 | | | |
| ,, Crewe Engineering Works .. | 9 | 18 | 3 | | | |
| | | | | 52 | 0 | 11½ |
| ,, Gross Receipts from Evening Meetings— | | | | | | |
| Conversazione .. .. .. .. | 13 | 3 | 5 | | | |
| Lecture by Mr. Bax .. .. | 0 | 2 | 0 | | | |
| ,, Dr. Wigglesworth .. | 0 | 5 | 0 | | | |
| ,, Mr. Schröder .. .. | 0 | 1 | 0 | | | |
| ,, Mr. Longbottom .. .. | 0 | 4 | 0 | | | |
| ,, Miss Montgomery .. .. | 0 | 7 | 0 | | | |
| ,, Miss Gertrude Bacon .. | 0 | 16 | 0 | | | |
| ,, Dr. Theodore Green .. | 0 | 5 | 0 | | | |
| ,, Rev. W. N. Howe .. | 0 | 16 | 0 | | | |
| ,, Rev. A. H. Fish .. .. | 0 | 3 | 0 | | | |
| ,, Dr. J. T. Roberts .. .. | 0 | 11 | 0 | | | |
| ,, Dr. Whichello .. .. | 0 | 2 | 0 | | | |
| 1901 Exhibition of Spring Flowers .. | 0 | 12 | 0 | | | |
| | | | | 17 | 7 | 5 |
| | | | | £300 | 8 | 4½ |

JOHN SIMON, HON. TREASURER.

| Cr. | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| 1900-1901. | | | | | | |
| To Museum Management Committee .. | | | | 65 | 0 | 0 |
| ,, Lantern Account .. .. .. .. | | | | 10 | 10 | 0 |
| ,, Natural History Museum and Library .. | | | | 22 | 15 | 4 |
| ,, Printing, Stationery, and Advertising .. | | | | 54 | 3 | 1 |
| ,, Postages .. .. .. .. .. | | | | 23 | 5 | 4½ |
| ,, Gross Expenses in connection with Excursions— | | | | | | |
| Beeston Castle .. .. .. .. | 7 | 7 | 8 | | | |
| Burton Point .. .. .. .. | 1 | 0 | 0 | | | |
| Powis Castle .. .. .. .. | 13 | 10 | 1 | | | |
| Dr. Mules, Gresford .. .. .. | 2 | 2 | 6 | | | |
| Moel Fammau .. .. .. .. | 6 | 4 | 8 | | | |
| Farndon Hall .. .. .. .. | 4 | 5 | 9 | | | |
| Eaton Hall Gardens .. .. .. | 1 | 17 | 0 | | | |
| Crewe Engineering Works .. .. | 8 | 3 | 11 | | | |
| | | | | 44 | 11 | 7 ∞ |
| ,, Gross Expenses of Evening Meetings— | | | | | | |
| 1900 Exhibition of Spring Flowers .. | 0 | 11 | 3 | | | |
| Conversazione .. .. .. .. | 17 | 4 | 6 | | | |
| Miss Gertrude Bacon .. .. .. | 2 | 2 | 0 | | | |
| Rev. A. H. Fish .. .. .. | 0 | 5 | 6 | | | |
| 1901 Exhibition of Spring Flowers .. | 0 | 11 | 6 | | | |
| | | | | 20 | 14 | 9 |
| ,, Salary—Assistant Secretary .. .. | | | | 10 | 0 | 0 |
| ,, Subscriptions— | | | | | | |
| Palæontographical Society .. .. | 1 | 1 | 0 | | | |
| Entomological Society .. .. .. | 1 | 1 | 0 | | | |
| Ray Society (2 years) .. .. .. | 2 | 2 | 0 | | | |
| | | | | 4 | 4 | 0 |
| ,, Collecting Subscriptions .. .. .. | | | | 1 | 7 | 0 |
| Balance in hand .. .. | | | | 43 | 17 | 3 |
| | | | | £300 | 8 | 4½ |

Examined with the Accounts and Vouchers relating thereto, and found to be correct, shewing a balance of £43 17s. 3d. in the hands of the Hon. Treasurer (in Lloyds' Bank, Limited).

CHESTER, 26TH APRIL, 1901.

*Signed* { BERESFORD ADAMS, E. NOEL HUMPHREYS, C.A. } HON. AUDITORS.

# "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Account for the Year ended 30th April, 1901. **Cr.**

| 1900-1901. | £ | s. | d. |
|---|---|---|---|
| To Balance from last Account | 7 | 1 | 6 |
| ,, Dividends on Great Western Railway Company Consolidated Ordinary Stock | 13 | 4 | 6 |
| ,, Bank Interest..... | 0 | 0 | 7 |
| | £20 | 6 | 7 |

| 1900-1901. | £ | s. | d. |
|---|---|---|---|
| By Prizes awarded as follows:— | | | |
| Miss M. Bowers..... | 5 | 0 | 0 |
| ,, E. C. Tomlin ..... | 3 | 0 | 0 |
| ,, G. M. Siddall ..... | 1 | 1 | 0 |
| Mr. J. Thompson ..... | 4 | 0 | 0 |
| ,, Mr. Pritchard for Lettering Board..... | 0 | 10 | 9 |
| ,, Cheque Book..... | 0 | 1 | 0 |
| Balance ..... .. | 6 | 13 | 10 |
| | £20 | 6 | 7 |

To Balance in Bank ..... £6 13 10

Examined and found correct,

G. P. MILN,
HON. TREASURER.

JOHN DAVIES,
HON. AUDITOR.

## KINGSLEY MEMORIAL PRIZES

ARE OFFERED AS FOLLOWS:—

**To any Resident in the Society's District.**—A PRIZE not exceeding TEN POUNDS for the best COLLECTION OF OBJECTS, OR ESSAYS, OR NOTES OF OBSERVATIONS, OR PHOTOGRAPHS illustrating the Natural Science of the Society's District. The amount given will be proportionate to the *quality* of the Collection.

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the persons competing.

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*The Collections, Essays, or Notes, must be sent in to either of the General Secretaries on or before* 1st *September, and the awards will be made at the Conversazione next succeeding the adjudication.*

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**NOTE.—The Committee have the option of retaining the successful Collections, &c., or any part of them, for the Society.**

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Intending Competitors can obtain all particulars, and the conditions under which the Prizes are offered, from either of the General Secretaries; and all Collections, &c., must be sent in to either of them on or before the 1st September in each year.

# CURATOR'S REPORT.

At first sight there appears to be a great falling off in the number of additions to our Museum as compared with those figures given in the previous Report (1899-1900), where it will be seen that the number of specimens acquired during that year reached to 9,810; whereas this year we have added 2,979, which shows a decrease of over 6,000 specimens. On the other hand, however, it is gratifying to find that the number of *species* added to the collections during the past year exceeds those of last year by about 350, which is a very important item, and shows that our collections in the various departments of Natural History are steadily increasing year by year.

Out of the grand total Mr. T. A. Coward has contributed *1,106 species, which includes his late Father's collection of Fossils and Minerals; and also his own magnificent collection of Local Eggs, amounting to 106 distinct species. Besides these, Mr. Coward and Mr. Charles Oldham have jointly presented four species of Birds, which are unique in the records for Cheshire; they are:—

(1) The Spoonbill (*Platalea leucorodia*, Lin.)
(2) Black-winged Stilt (*Himantopus candidus*, Bon.)
(3) Slavonian Grebe (*Podicipes auritus*, Lin.)
(4) Bearded Titmouse (*Panurus biarmicus*, Lin.)

Mr. Oldham has also been revising the *Molluscan Fauna* of our district, and has added several species new to our collection. He has also kindly offered to overhaul our series and extend the collection as far as lies in his power.

Many important additions have been made to the collection of *Lepidoptera*, including several species new to the Society's district, to which Messrs. J. Arkle, N. F. Barnes, A. D. Pitcairn Campbell, Dr. Herbert Dobie, J. Henry Stock, M.P., the Misses Steele Perkins, and your Curator, have contributed. The names of the more interesting species will be found in the Report of the Secretary of the Zoological Section.

Dr. Herbert Dobie and Mr. George Herbert Stolterfoth have each contributed a specimen of the interesting Musk Beetle, *Aromia moschata*, an insect of great rarity in the Society's district, and is now for the first time added to our collection.

The acquisition of Mr. Coward's collection of Eggs will necessitate the purchase of a suitable Cabinet for their display, and this may also be said of the important collection of Shells which was last year presented by Surg.-Col. Archer. This will mean a serious outlay, and will draw considerably on the funds of the Society during the next financial year.

* These figures are approximate.

No new Bird Groups have been completed during the year, but a great deal of material has been collected, and it is hoped this may be completed during the coming year. Much of the work during the past year has been in the preparation of specimens and the cataloguing and re-arrangement of the various collections which have been acquired. The following is an abstract of the collections sent in, and on the following page will also be found a list of the donors and their donations,

Your Curator begs also to thank MR. W. F. J. SHEPHEARD, DR. STOLTERFOTH, and the President, for material aid in the loan of Photographic Apparatus.

The additions to the Natural History Museum are as follows:—

| ABSTRACT OF THE REPORT. | Species Presented and Purchased | Total of Specimens |
|---|---|---|
| Geology .. .. .. .. .. .. .. .. | 1,020 | 1,063 |
| *Hemiptera—Homoptera* (Frog-hoppers, &c.) .. .. | 10 | 25 |
| *Lepidoptera* (Moths and Butterflies) .. .. .. .. | 117 | 299 |
| *Coleoptera* (Beetles) .. .. .. .. .. .. | 28 | 105 |
| *Hymenoptera* (Bees and Wasps) .. .. .. .. | 109 | 434 |
| *Conchology* (Shells) .. .. .. .. .. .. | 16 | 170 |
| *Pisces* (Fish) .. .. .. .. .. .. .. | 2 | 2 |
| *Reptilia* (Snakes, &c.) .. .. .. .. .. .. | 1 | 1 |
| Eggs .. .. .. .. .. .. .. .. | 107 | 579 |
| *Aves* (Birds) .. .. .. .. .. .. .. | 18 | 25 |
| *Mammalia* (Animals) .. .. .. .. .. .. | 2 | 4 |
| Plants .. .. .. .. .. .. .. .. | 272 | 272 |
| Total .. .. .. .. | 1,702 | 2,979 |

## LIST OF UNCLASSIFIED GIFTS:—

MR. FRANCIS HEATHERLEY—Five Photographs of Birds from Life.

MR. CHAS. OLDHAM—Several gross of Glass Tubes, Glass-topped Boxes, Card Trays, &c., for mounting specimens.

MR. FRANK WILLIAMS—Old Microscope.

DR. H. STOLTERFOTH—Photographic Enlargement of Opah Fish.

R. NEWSTEAD, F.E.S., HON. F.R.H.S.,
CURATOR.

APRIL, 1901.

| | Geology. | | *Hemiptera—Homoptera* (Frog-hoppers, &c.) | | *Lepidoptera* (Moths & Butterflies). | | *Coleoptera* (Beetles). | | *Hymenoptera* (Bees & Wasps). | | *Conchology* (Shells). | | *Pisces* (Fish). | | *Reptilia* (Snakes, &c.) | | Eggs. | | *Aves* (Birds). | | *Mammalia* (Animals). | | Plants. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Species. | Specimens. | Species. | Specimens. | Species | Specimens. | Species. | Specimens. | Species. | Specimens. | Species | Specimens. | Species. | Specimens. | Species. | Specimens. | Species | Specimens. | Species | Specimens. | Species. | Specimens. | Species. | Specimens. |
| Mr. J. Arkle ... ... ... | ... | ... | ... | ... | 11 | 52 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. Bairstow ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. N. F. Barnes .. .. | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. R. W. Bate ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... |
| *Miss Bowers ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 272 | 272 |
| Mr. W. E. Brown ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. A. D. Pitcairn Campbell ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... |
| Mr. James Clutton ... ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. T. A. Coward ... ... | 1000‡ | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 106 | 575 | ... | ... | ... | ... | ... | ... |
| Mr. Critchlow .. ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | ... | ... | ... | ... |
| The Curator ... ... ... | ... | ... | ... | ... | 33 | 144 | 26 | 103 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. George O. Day ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | 1 | 1 | ... | ... | ... | ... |
| Dr. Herbert Dobie ... ... | ... | ... | ... | ... | 7 | 24 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. Isaac Edwards .. .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 4 | ... | ... | ... | ... | ... | ... |
| Mr. Howel Evans ... .. | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Miss Lloyd Fletcher ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. S. Mossford .. ... ... | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... |
| Mr. Chas. Oldham ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 16 | 170 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Messrs. C. Oldham and T. A. Coward ... ... ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | 5 | ... | ... | .. | ... |
| Mr. A. C. Parker ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Misses Steele Perkins ... ... | ... | ... | ... | ... | 51 | 64 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| The President (Mr. J. D. Siddall) | 16 | 57 | ... | .. | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... |
| Mr. Thos. Roberts ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | 1 | 1 | ... | ... | ... | ... |
| Mr. Thos. Ruddy ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... |
| Mr. J. Henry Stock, M.P. ... | ... | ... | ... | ... | 13 | 13 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. George Herbert Stolterfoth | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| †Miss C. E. Tomlin ... ... | ... | ... | 10 | 25 | ... | ... | ... | ... | 109 | 434 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mr. J. W. Williams ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... |
| Purchased ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | .. | 8 | 13 | ... | ... | ... | ... |

* Prize Collection. † Including Prize Collection. ‡ These figures are approximate.

# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1900.

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

The results here given are deduced from bi-daily observations of the standard instruments, taken at 9·0 a.m. and 9·0 p.m. local mean time. Returns are sent to the Royal Meteorological Society, the Meteorological Council, the Scottish Meteorological Society, and many private observers in different parts of the Empire.

January.—A very wet, rather windy and sunless month, with a few bright, clear sunny days. Temperature about 3·0 degrees above the average. Only two nights below the freezing point; while on the ground it fell below freezing 19 times. The wind did not reach the force of a gale, although on the 10th, 18th, and 26th it blew strongly from the N.W. An excessive number of wet, drizzly days. Fog on the 11th, 14th, and 16th. Very dull and cheerless.

February.—Very low pressure, falling to 28·474 on 19th. First fortnight very wintry, the second ushered in by a strong S.S.Easterly wind, much milder. Mean temperature of month 4·0 degress below the average. Snow fell on five days, and lay throughout the first half of the month. Fog on 14th. The exceptionally low temperature on the ground of 6·0 degrees took place on the 8th. Only one night during the first three weeks was without frost on the ground.

March.—A dry, cold, dull month. Snow fell on the 17th, Sleet on the 18th; there was only six days' rain besides. Two days' fog, with many very dull mornings. The temperature was about 5·0 degrees below the average.

April.—A month of normal temperature. From 10th to 16th excessively windy. No day without some bright sunshine. Frost in shade, four feet above ground, on five nights; on ground 11 nights.

May.—Rather below the average temperature, through defect of the day temperature. Only once, and that on the 1st, was there frost on the ground. Rainfall normal, but on fewer than the usual number of days. Fully an inch fell on five out of the first eight days; the last half of the month being very dry, very little rain falling on three out of 16 days. Rather cloudy and breezy in the mornings. A very backward month for vegetation.

June.—A month of average temperature, sunshine, and cloud, with a prevalence of westerly winds, and one gale from N.W., on Tuesday 26th, and a severe thunderstorm, on Tuesday the 12th. Lightning alone having been seen four times, and thunder heard once. The temperature exceeded 70·0 degrees on ten days, and only fell to 50 degrees on nine. Rain $\frac{1}{2}$-inch fully under the average. Only once, on the 22nd, did more than $\frac{1}{4}$-inch fall in the 24 hours.

July.—A bright warm month, fully 5·0 degrees above the average. On 13 days temperature exceeded 75·0 degrees, and on 14 fell below 55·0 degrees. For seven days, from 19th to 25th, the minimum temperature was above 61·0 degrees. During this period, on the 24th, the highest day temperature, 86·0 degrees, took place—only exceeded once in the last 10 years by a July maximum, that of 21st July, 1887, which was 86·1 degrees. Rain nearly one-third of an inch below average; fully $1\frac{3}{4}$ inches fell on the 29th. There were 23 days without any rain. N.Westerly gales blew on the 3rd, 5th, and 16th.

August.—A month of average temperature, wind, and cloud. The day temperature only once exceeding 75·0 degrees, and the minimum was five times above 55·0 degrees. $2\frac{1}{4}$ inches of rain fell on Bank Holiday, accompanying a series of most severe thunderstorms. Thunder was heard without lightning being seen on the 22nd and 23rd. The rainfall was fully double the average amount. Three days without bright sunshine. Prevailing wind southerly.

SEPTEMBER.—A somewhat warm September, sunny and dry. $1\frac{1}{3}$ inches less than the average rainfall. Six days above 69·0 degrees, and on four the minimum was above 49·0 degrees. One day without bright sunshine. Pressure considerably above the average. No frost on ground. Lowest ground temperature 36·2 degrees on 12th. Heavy dews from 3rd to 19th.

OCTOBER.—$2\frac{1}{2}$ degrees above the average temperature. Day temperature seven times exceeded 61·0 degrees, and the minimum 23 times exceeded 41·0 degrees. Nearly one inch more than the average amount of rain fell on 23 days. The lowest night temperature in the shade did not reach the freezing point. Two nights, the 21st and 22nd, there were slight ground frosts. Extremely low mean daily range of temperature. Fog on the 30th. Thunderstorms, with hail, on 26th and 27th.

NOVEMBER.—A mild month, $2\frac{1}{2}$ degrees above the average. Four days above 55·0 degrees, and 16 times the minimum exceeded 40·0 degrees. On the 19th and 24th there was frost in the shade, and on the ground 8 times. The pressure was a quarter of an inch below the average. The winds were light, from the west. First hoar frost on 23rd. There was fog on the 2nd, 3rd, and 21st.

DECEMBER.—An unprecedentedly warm month, having the same average temperature as a normal April, fully $7\frac{3}{4}$ degrees above the average. On 18 days the temperature was above 50·0 degrees, and on 23 nights the minimum was above 40·0 degrees; on one night, the 12th, 51·8 degrees. Frost in shade on only one night, the 23rd, when the minimum touched 30·0 degrees. There were seven times frost on the ground; lowest reading, 27·2 degrees, on 23rd. Gales on 20th, 21st, and 28th. Fog on 27th and 30th.

As the tables give the Meteorological elements for the year 1900 only, it is desirable to add a comparison of the winter and spring months of the present year in brief.

## SHADE TEMPERATURE, AND DIFFERENCE FROM AVERAGE.

| **Winter of 1900-1.** | | **Spring of 1901.** | |
|---|---|---|---|
| December .. .. | 46·5°+7·8° | March .. .. | 40·3°+0·1° |
| January .. .. | 38·7°+1·2° | April .. .. | 48·3°+1·7° |
| February .. .. | 34·9°−5·1° | May .. .. .. | 53·5°+1·1° |
| Mean .. .. | 40·0°+1·3° | Mean .. .. | 48·0°+0·9° |

THE WINTER MONTHS.—*December* was $7\frac{3}{4}$ degrees fully *above* the average temperature, *January* $1\frac{1}{4}$ almost *above* it, and *February* fully 5 degrees *below* it. The abnormally warm December continuing a high autumn temperature, and followed by an unusually mild January, made the sudden transition to severe winter weather throughout the whole of February most trying.

THE SPRING MONTHS.—*March*—Normal temperature, but rather wet, and decidedly wintry, with repeated falls of snow during the last week. *April*—Also rather wet, but warmer $1\frac{3}{4}$ degrees than the average; from 19th to 26th perfect summer days—which brought us at a bound from winter to summer. *May*—A charming month, about one degree above the average temperature.

## NOTEWORTHY PHENOMENA OF 1900.

| | |
|---|---|
| Greatest atmospheric pressure..... | 30·712 in., 13th March |
| Least „ „ ..... | 28·474 in., 19th February |
| Hottest day in shade..... | 86·0 degs., 24th July |
| Coldest nights in shade ..... | 11·7 degs., 8th & 9th Feb. |
| Greatest range of temperature in 24 hours .. | 33·0 degs., 3rd June |
| Least „ „ „ „ .. | 1·6 degs., 2nd December |
| Hottest day in sun..... | 130·0 degs., 23rd July |
| Coldest night on ground ..... | 6·0 degs., 8th February |

Greatest excess of open air temperature over shade temperature, 58·0 degs., 20th June.

Greatest difference between lowest temperature in shade and on ground, 13·5 degs., 19th July.

Greatest rainfall on any one day (wet Bank Holiday), 2·225 in., 6th August.

Latest Spring frost, 2·5 degs., 1st May.

Earliest Autumn frost, 2·8 degs., 22nd October.

Severe gales, 13th April and 20th, 21st, and 28th December.

Very severe thunderstorms on 12th June, 28th and 29th July, and 5th and 6th August.

Greatest number of consecutive days on which rain fell 11—13th to 23rd February.

Greatest number of consecutive days on which no rain fell 13—14th to 28th July.

Sunniest day of the year, 12 hours, 15th August, being 87 per cent. of the total possible.

More bright sunshine in the afternoons, averaging half-an-hour on each day of bright sunshine.

Welsh Hills at 9 a.m.—These were only visible on 129 days, only a little more than one-third of the year; 18 days clearly and 6 very clearly seen.

## EXPLANATIONS.

*The Barometer* readings, taken at 9-0 a.m. and 9-0 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9-0 a.m, and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9-0 a.m. and placed to previous day.

*Ground Temperatures* read twice daily at 9-0 a.m. and 9-0 p.m. The lowest reading for the 24 hours, prior to 9-0 a.m., is entered to the previous day.

*Underground Temperatures* taken daily at 9-0 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew Point (as determined by Glaisher's Factors), by that corresponding to the temperature of the air (*i.e.* the Dry-bulb reading).

*The Rain* is measured at 9-0 a.m., and the amount entered to the previous day. A fall of 0·006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9-0 a.m., and 9-0 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8.0 an overcast day.

The *wind* direction is taken by means of a Compass Nephoscope, from the drift of the lower clouds.

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Ozone* read at 9-0 a.m. (according to Dr. Moffat's Scale 0—12), and placed to previous day.

*Sunshine Record.*—The photographic traces are fixed *before* being measured.

*Fog, &c.*—The fog, haze, &c., are made from the visibility of objects and lights at definite distances from Rutland Cottage.

*Local Mean Time* is used for the regular observations.

# METEOROLOGICAL OBSERVATIONS

## RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N.; Long. 11m. 36s. W.

MONTHLY SUMMARY OF

| | JAN. | FEB. | MARCH. | APRIL |
|---|---|---|---|---|
| PRESSURE (reduced to 32° F., and mean sea level)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 29·901in. | 29·553in | 30·433in. | 29·95 |
| Highest reading | 30·457in. | 30·087in. | 30·712in. | 30·56 |
| ,, ,, Date of | 11 | 28 | 13 | 19 |
| Lowest ,, | 29·269in. | 28·474in. | 29·235in. | 29·22 |
| ,, ,, Date of | 3 | 19 | 19 | 3 |
| Range | 1·188in. | 1·613in. | 1·477in. | 1·34 |
| TEMPERATURE in shade (Stevenson's screen)— | | | | |
| Approximate mean | 41·0° | 36·0° | 38·7° | 47·2 |
| Mean maximum | 45·2° | 41·6° | 44·8° | 56·0 |
| Mean minimum | 36·4° | 29·9° | 32·9° | 39·3 |
| Extreme maximum | 54·2° | 58·2° | 56·6° | 73·1 |
| ,, ,, Date of | 23 | 23 | 11 | 21 |
| ,, minimum | 30·9° | 11·7° | 20·7° | 28·9 |
| ,, ,, Date of | 21 | 8 & 9 | 18 | 26 |
| ,, range | 23·3° | 46·5° | 35·9° | 44·2 |
| Mean daily range | 8·8° | 11·7° | 11·9° | 16·7 |
| Maximum daily range | 18·9° | 24·5° | 26·5° | 28·6 |
| ,, ,, Date of | 21 | 9 | 31 | 21 |
| Minimum ,, | 3·9° | 4·5° | 4·7° | 10·4 |
| ,, ,, Date of | 30 | 25 | 7 | 15 |
| Number of nights at or below 32° | 2 | 16 | 12 | 5 |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 59·2° | 72·2° | 75·6° | 95·3 |
| Extreme maximum | 83·5° | 93·5° | 92·5° | 113·3 |
| ,, ,, Date of | 23 | 23 | 29 | 23 |
| Greatest excess over shade maximum | 30·9° | 46·8° | 46·4° | 52·1 |
| ,, ,, ,, ,, Date of | 27 | 14 | 16 | 5 |
| Average ,, ,, ,, | 14·0° | 30·6° | 30·8° | 39·1 |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 31·5° | 27·6° | 31·4° | 33·1 |
| Extreme minimum | 25·7° | 6·0° | 21·6° | 24·1 |
| ,, ,, Date of | 11 | 8 | 29 | 2 |
| Greatest difference from shade minimum | 10·0° | 8·7° | 7·0° | 9·1 |
| ,, ,, ,, ,, Date of | 7 | 17 | 12 | 1 |
| Mean ,, ,, ,, | 4·9° | 2·3° | 1·5° | 6·1 |
| Number of nights at or below 32° | 19 | 20 | 16 | 1 |
| TEMPERATURE underground— | | | | |
| Mean at 1 foot | 39·5° | 37·0° | 39·9° | 46·1 |
| Range ,, | 3·9° | 9·0° | 4·9° | 12·1 |
| Mean at 2 feet | 40·7° | 38.5° | 40·9° | 45·1 |
| Range ,, | 2·5° | 5·8° | 2·8° | 11·1 |
| Mean at 3 feet | 42·3° | 43·2° | 41·9° | 45·1 |
| Range ,, | 1·2° | 4·1° | 1·8° | 6·1 |
| Mean at 4 feet | 43·0° | 41·3° | 42·2° | 44·1 |
| Range ,, | 0·5° | 3·1° | 1·0° | 5·1 |
| Air temperature, 9 a.m. | 40·5° | 35·2° | 39·1° | 49·1 |
| Range of ,, ,, | 16·5° | 32·1° | 14·7° | 21·1 |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 2·870 | 3·260 | ·920 | 1·15 |
| ,, ,, since 1st January | 2·870 | 6·130 | 7·050 | 8·25 |
| Maximum fall in 24 hours | ·620 | ·725 | ·380 | ·35 |
| ,, ,, Date of | 6 | 15 | 19 | |
| Number of days 0·01 fell | 22 | 19 | 8 | 1 |
| ,, ,, since 1st January | 22 | 41 | 49 | 6 |
| Mean relative humidity, 9 a.m. | 91 | 90 | 83 | 8 |
| ,, ,, 9 p.m. | 90 | 88 | 90 | 9 |
| ,, ,, of both | 91 | 89 | 87 | 8 |
| Mean vapour pressure, 9 a.m. | ·226 | ·188 | ·206 | ·279 |
| ,, ,, 9 p.m. | ·222 | ·195 | ·203 | ·265 |
| ,, ,, of both | ·224 | ·192 | ·205 | ·272 |
| Mean dew point, 9 a.m. | 37·9° | 32·5° | 35·1° | 43·° |
| ,, ,, 9 p.m. | 37·5° | 33·3° | 35·3° | 41·° |
| ,, ,, of both | 37·7° | 32·9° | 35·2° | 42·° |

MOSPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| Y. | JUNE. | JULY. | AUGUST. | SEPT. | OCTOBER. | NOV. | DEC. | YEARLY SUMMARY. |
|---|---|---|---|---|---|---|---|---|
| 71in. | 29·909in. | 29·966in. | 29·943in. | 30·107in. | 29·918in. | 29·725in. | 29·814in. | 29·933in. |
| 80in. | 30·373in | 30·271in. | 30·414in. | 30·573in. | 30·604in. | 30·500in. | 30·403in. | 30·712in. |
| | 1 | 7 | 13 | 12 | 21 | 18 | 16 | Mar. 13. |
| 86in. | 29·552in. | 29·568in. | 29·160in. | 29·466in. | 29·256in. | 29·202in. | 28·699in. | 28·474in. |
| | 25 | 1 | 6 | 27 | 26 | 16 | 28 | Feb. 19. |
| 94in. | 0·821in. | 0·703in. | 1·254in. | 1·107in | 1·348in. | 1·298in. | 1·704in. | 2·238in. |
| 9° | 59·0° | 64·5° | 60·0° | 56·9° | 50·3° | 45·8° | 46·5° | 49·7° |
| 5° | 68·5° | 74·2° | 68·9° | 65·8° | 56·8° | 51·0° | 50·6° | 56·9° |
| 3° | 50·8° | 56·0° | 52·2° | 48·8° | 44·3° | 40·7° | 42·1° | 43·1° |
| 3° | 79·5° | 86·0° | 77·8° | 73·4° | 69·0° | 60·4° | 58·7° | 86·0° | |
| | 10 | 24 | 14 | 16 | 7 | 1 | 20 | July 24. |
| 2° | 41·4° | 48·8° | 47·0° | 38·6° | 32·2° | 27·8° | 30·0° | 11·7° |
| | 1 | 27 | 29 | 3 | 22 | 24 | 23 | Feb. 8 & 9. |
| 0° | 38·1° | 37·2° | 30·8° | 34·8° | 36·8° | 32·6° | 28·7° | 74·3° |
| 2° | 17·7° | 18·2° | 16·7° | 17·0° | 12·5° | 10·3° | 8·5° | 13·8° |
| 0° | 33·0° | 32·2° | 28·4° | 25·0° | 24·1° | 17·8° | 12·9° | 33·0° |
| | 3 | 27 | 14 | 3 | 6 | 19 | 20 & 21 | June 3. |
| 3° | 8·8° | 7·6° | 9·8° | 6·7° | 4·1° | 2·8° | 1·6° | 1·6° |
| | 26 | 2 | 20 | 1 | 30 | 6 | 2 | Dec. 2. |
| | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 38 |
| 0° | 112·3° | 115·0° | 104·4° | 98·9° | 85·9° | 67·9° | 58·6° | 86·9° |
| 0° | 125·2° | 130·0° | 117·6° | 113·6° | 107·2° | 89·0° | 87·6° | 130·0° |
| | 20 | 25 | 18 | 10 | 7 | 8 | 25 | July 25. |
| 3° | 58·0° | 54·7° | 45·5° | 49·4° | 43·2° | 34·4° | 31·1° | 58·0° |
| | 20 | 1 | 26 | 10 | 15 | 8 | 25 | June 20. |
| 5° | 43·8° | 40·8° | 35·5° | 33·1° | 29·1° | 16·9° | 8·0° | 30·2° |
| 8° | 50·8° | 52·2° | 50·2° | 48·8° | 42·4° | 36·8° | 37·0° | 40·2° |
| 7° | 35·6° | 44·5° | 44·3° | 36·2° | 29·2° | 26·0° | 27·2° | 6·0° |
| | 1 | 3 | 29 | 12 | 22 | 19 | 23 | Feb. 8. |
| 3° | 5·0° | 13·5° | 9·1° | 8·7° | 11·3° | 7·5° | 9·2° | 13·5 |
| | 10 & 17 | 19 | 18 | 9 | 10 | 16 | 16 | July 19. |
| 5° | 2·3° | 4·8° | 2·3° | 4·5° | 1·9° | 3·9° | 5·1° | 3·6° |
| 1 | 0 | 0 | 0 | 0 | 2 | 8 | 7 | 84 |
| 5° | 58·7° | 62·6° | 61·0° | 57·8° | 51·3° | 46·4° | 44·2° | 49·8° |
| 3° | 7·5° | 8·7° | 5·8° | 3·0° | 8·9° | 10·2° | 5·8° | 7·4° |
| 6° | 57·3° | 60·0° | 60·8° | 58·4° | 52·8° | 48·0° | 45·6° | 49·9° |
| 6° | 6·3° | 7·5° | 4·0° | 2·9° | 7·7° | 6·9° | 3·2° | 5·5° |
| 7° | 55·5° | 59·0° | 60·3° | 58·4° | 54·1° | 49·7° | 46·9° | 50·5° |
| 2° | 4·6° | 5·5° | 2·8° | 1·8° | 5·9° | 5·1° | 1·7° | 3·8° |
| 8° | 53·6° | 57·0° | 59·0° | 57·6° | 54·3° | 50·4° | 47·4° | 49·9° |
| 3° | 4·2° | 4·9° | 1·8° | 1·7° | 4·9° | 4·1° | 1·4° | 3·0° |
| 5° | 60·5° | 67·7° | 61·0° | 58·4° | 51·3° | 45·1° | 45·5° | 50·5° |
| 0° | 13·8° | 22·2° | 13·8° | 18·6° | 24·1° | 22·1° | 25·5° | 20·8° |
| 415 | 1·895 | 2·530 | 6·445 | ·890 | 3·900 | 3·115 | 3·170 | ... |
| 540 | 11·435 | 13·965 | 20·410 | 21·300 | 25·200 | 28·315 | 31·485 | 31·485 |
| 500 | ·330 | 1·850 | 2·225 | ·235 | ·745 | ·400 | ·770 | 2·225 |
| 5 | 22 | 29 | 6 | 18 | 14 | 28 | 30 | Aug. 6. |
| 1 | 15 | 8 | 16 | 12 | 23 | 19 | 21 | 23 days, Oct. |
| 4 | 89 | 97 | 113 | 125 | 148 | 167 | 188 | 188 |
| 7 | 75 | 64 | 77 | 81 | 83 | 84 | 88 | 82 |
| 3 | 83 | 75 | 97 | 89 | 89 | 91 | 88 | 88 |
| 5 | 79 | 70 | 82 | 85 | 86 | 88 | 88 | 85 |
| 300 | ·392 | ·436 | ·420 | ·399 | ·315 | ·259 | ·266 | ·307 |
| 287 | ·389 | ·411 | ·457 | ·376 | ·304 | ·265 | ·269 | ·305 |
| 293 | ·391 | ·423 | ·439 | ·388 | ·310 | ·262 | ·267 | ·304 |
| 1° | 52·5° | 55·2° | 54·1° | 52·7° | 46·2° | 41·1° | 41·3° | 44·8° |
| 9° | 52·2° | 53·5° | 56·4° | 51·1° | 45·4° | 41·8° | 42·1° | 44·5° |
| 5° | 52·3° | 54·3° | 55·2° | 51·9° | 45·8° | 41·4° | 42·0° | 44·7° |

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | Bright Sunshine. Hours ending Local Apparent Time of each Day of the Month. Forenoon. 6 | 7 | 8 | 9 | 10 | 11 | Noon | Afternoon. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Monthly. Total Hours. | Greatest Possible Percentage. | No. of days without. | Seasons. Hours and Percentage. | Cloud (1—10). 9 a.m. | 9 p.m. | Daily Mean. | No. of days Overcast. | Clear. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. ... | | | | ·08 | 1·91 | 7·92 | 7·17 | 7·25 | 4·85 | 5·60 | ·25 | 1·0 | | | | 36·03 | 14·6 | 18 | Winter 121·03 16·3% | 8·6 | 6·4 | 7·5 | 15 | — |
| Feb. .. | | | | ·25 | 2·92 | 8·50 | 12·91 | 13·50 | 7·00 | 4·00 | 2·75 | | | | | 51·83 | 19·2 | 11 | | 7·6 | 5·6 | 6·6 | 12 | 3 |
| March.. | | ·33 | 7·47 | 12·02 | 11·57 | 10·34 | 13·82 | 12·00 | 10·94 | 7·59 | 8·00 | 5·08 | ·25 | | | 99·41 | 27·3 | 8 | Spring 459·42 36·2% | 8·5 | 7·0 | 7·7 | 17 | 1 |
| April... | | | 14·00 | 15·66 | 15·50 | 12·40 | 14·32 | 17·91 | 18·31 | 19·75 | 18·50 | 17·10 | 16·33 | 6·40 | | 186·18 | 45·0 | — | | 7·1 | 4·1 | 5·6 | 6 | 3 |
| May ... | 1·50 | 7·64 | 11·58 | 10·80 | 12·09 | 13·97 | 12·99 | 14·99 | 16·07 | 16·66 | 15·24 | 15·26 | 13·23 | 10·90 | ·91 | 173·83 | 35·8 | 5 | | 7·7 | 5·7 | 6·8 | 11 | 1 |
| June ... | 3·42 | 8·08 | 15·16 | 16·42 | 17·06 | 19·17 | 16·56 | 14·49 | 15·74 | 13·59 | 17·56 | 17·03 | 14·09 | 10·15 | 2·33 | 200·85 | 40·2 | 1 | | 7·4 | 8·0 | 7·7 | 9 | 1 |
| July ... | **2·72** | **10·82** | **14·73** | **15·46** | **16·91** | **18·10** | **20·59** | **18·74** | **19·67** | **19·35** | **19·29** | **16·82** | **15·87** | **12·22** | **1·04** | **222·33** | **44·5** | 1 | Summer 616·36 42·5% | 6·0 | 5·9 | 6·0 | 4 | 2 |
| Aug. ... | | 1·75 | 13·67 | 19·24 | 21·32 | 20·83 | 19·49 | 20·00 | 18·66 | 18·24 | 15·58 | 10·92 | 9·90 | 3·58 | | 193·18 | 43·0 | 3 | | 7·0 | 5·3 | 6·1 | 6 | 2 |
| Sept. ... | | | 8·51 | 15·08 | 14·74 | 14·48 | 15·47 | 17·99 | 16·50 | 18·00 | 19·81 | 13·50 | 10·38 | ·58 | | 165·04 | 44·1 | 1 | | 6·9 | 4·4 | 5·6 | 7 | 2 |
| Oct. ... | | | 2·25 | 7·83 | 14·97 | 13·75 | 9·55 | 9·74 | 9·01 | 11·15 | 10·49 | 2·74 | | | | 91·48 | 28·4 | 3 | Autumn 313·40 33·0% | 7·5 | 7·5 | 7·5 | 14 | — |
| Nov. ... | | | ·25 | 1·75 | 6·07 | 8·76 | 10·82 | 11·99 | 7·83 | 7·75 | 1·16 | ·50 | | | | 56·88 | 22·4 | 12 | | 7·6 | 7·2 | 7·4 | 15 | 1 |
| Dec. ... | | | | | ·25 | 4·17 | 7·09 | 8·17 | 8·41 | 5·08 | | | | | | 33·17 | 14·5 | 18 | | 8·4 | 6·7 | 7·7 | 14 | — |
| | 7·64 | 28·62 | 87·62 | 114·59 | 135·31 | 152·39 | 160·78 | 166·77 | 153·99 | 146·76 | 128·63 | 99·95 | 80·05 | 43·83 | 4·28 | 1510·21 | 34·3 | 81 | | 7·5 | 6·3 | 6·9 | 130 | 16 |
| | During Forenoon 686·95. | | | | | | | During Afternoon 823·26. | | | | | | | | | | | | | | | | |

## WIND AND OZONE.

| | Force. | | | | | Direction to 8 Points of the Compass. | | | | | | | | | Ozone. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 9 p.m. | Mean. | Maximum. | Date of. | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. | Mean Amount. | Maximum. |
| January ... | 1·4 | 1·2 | 1·3 | 6 | 18 | NW | 4 | — | — | 5 | 8 | 6 | 7 | 13 | 19 | 2·2 | 7 |
| February | 1·1 | 1·0 | 1·0 | 5 | 15 | NW | 4 | 2 | 3 | 4 | 2 | 4 | 6 | 7 | 24 | 1·2 | 6 |
| March..... | 1·3 | 0·9 | 1·1 | 6 | 13 | NE | 5 | 13 | 5 | 4 | 5 | 1 | 2 | 6 | 21 | 1·7 | 6 |
| April ..... | 2·1 | 0·8 | 1·5 | 9 | 13 | W | 2 | — | 2 | 2 | 5 | 5 | 12 | 10 | 22 | 2·9 | 6 |
| May..... | 2·0 | 0·9 | 1·5 | 5 | 3 & 28 | NW | 3 | 6 | 6 | 4 | 4 | 7 | 5 | 10 | 17 | 2·9 | 6 |
| June ..... | 2·8 | 1·5 | 2·2 | 7 | 26 | NW | 1 | 5 | 3 | 4 | 8 | 12 | 10 | 11 | 6 | 3·1 | 6 |
| July ..... | 1·4 | 1·4 | 1·4 | 7 | 3,5 & 6 | NW | 2 | — | — | 3 | 7 | 3 | 16 | 16 | 15 | 2·8 | 7 |
| August ... | 1·9 | 0·5 | 1·2 | 6 | 4 | S | 5 | 4 | 5 | 4 | 9 | 2 | 6 | 5 | 22 | 2·2 | 6 |
| September | 2·4 | 1·1 | 1·8 | 6 | 24 & 30 | W | 2 | 1 | — | 7 | 5 | 5 | 10 | 12 | 18 | 1·7 | 6 |
| October ... | 2·7 | 1·8 | 2·3 | 8 | 14 | W | 1 | 1 | — | 2 | 1 | 12 | 18 | 14 | 13 | 2·6 | 7 |
| November | 1·2 | 1·3 | 1·2 | 5 | 8 | W | 1 | 3 | 5 | 8 | 5 | 8 | 13 | 5 | 12 | 0·5 | 5 |
| December | 2·1 | 2·3 | 2·2 | 9 | 20 | W | 2 | — | 4 | 4 | 12 | 9 | 21 | 5 | 5 | 1·8 | 6 |
| Totals ..... | 1.9 | 1·3 | 1·6 | 9 | Apr. 13 Dec. 20 | NW | 32 | 35 | 33 | 51 | 71 | 74 | 126 | 114 | 194 | 2·1 | 7 |
| Percentages | | | | | | W | 4·4 | 4·8 | 4·5 | 7·0 | 9·7 | 10·0 | 17·3 | 15·7 | 26·6 | | |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | At 9 a.m. or 9 p.m. or both. | | | | | At any Hour. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dew. | Hoar Frost. | Welsh Hills, 9 a.m. Visible. Invisible | Clearly | Very clearly | Thunder Storm. | Lightning only. | Thunder only. | Corona. | Gales. | Aurora. | Snow. | Hail. | Fog. |
| January ..... | 14 | 1 | 22 | — | — | — | — | — | 1 | — | — | — | 1 | 1 |
| February ... | 1 | 11 | 14 | — | — | — | — | — | — | — | — | 4 | — | 2 |
| March..... | 6 | 4 | 28 | — | — | 1 | — | — | — | — | — | 1 | 1 | 2 |
| April ..... | 15 | — | 23 | — | 1 | — | — | — | — | 2 | — | — | — | — |
| May..... | 8 | — | 18 | — | 1 | — | — | — | — | — | — | — | — | — |
| June ..... | 3 | — | 11 | — | 1 | 1 | 1 | 4 | — | 1 | — | — | — | — |
| July ..... | 1 | — | 7 | 7 | 2 | 2 | — | — | — | 3 | — | — | — | — |
| August ..... | 8 | — | 24 | 3 | — | 2 | 2 | 3 | — | — | — | — | — | — |
| September... | 21 | — | 18 | 3 | — | — | — | — | — | — | — | — | — | 3 |
| October ..... | 5 | — | 16 | 3 | 1 | 3 | — | 1 | — | 3 | — | — | 2 | 1 |
| November ... | 10 | 1 | 28 | — | — | — | — | — | — | — | — | — | — | 3 |
| December ... | 4 | 3 | 27 | 2 | — | — | — | — | — | 3 | — | — | — | 2 |
| Total... .. | 96 | 20 | 236 | 18 | 6 | 9 | 3 | 8 | 1 | 12 | — | 5 | 4 | 14 |

## BOTANICAL SECTION.

The Botanical Section has met once only during the past winter, on January 17th, 1901, when DR. C. THEODORE GREEN, of Birkenhead (and Vice-President of the Liverpool Naturalists' Field Club), delivered an instructive and interesting Lecture on "Notes on the Flora of Wirral."

In the course of his Lecture, DR. GREEN described a series of rambles in and about the Hundred of Wirral, reference being made to some 170 of the rarer or more interesting Plants to be found, and their peculiarities described.

A. E. GOODMAN, *Secretary.*

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## ZOOLOGICAL SECTION.

Two Meetings were held under this Section, the first, on Thursday, January 24th, had to be postponed—on account of the death of Her Majesty Queen Victoria—to March 21st, when notes of the past year were contributed by Dr. W. Henry Dobie (Chairman), Mr. J. Arkle, and Mr. R. Newstead (Curator). Mr. Newstead made the following records of *Birds* :—

*Falco subbuteo.*—Hobby nested at Delamere, and successfully reared its young. One of the latter was subsequently shot, and sent to one of the Museums at Cambridge. Mr. Newstead wrote in reference to this, but received no answer.

*Falco peregrinus.*—Peregrine Falcon at Bala, N.W., and Hatton, Cheshire.

*Dendrocopus minor.*—Lesser Spotted Woodpecker nesting at Eaton, and the occurrence of the Goldfinch near Chester.

He also gave an interesting account of the devastation of the pasture lands forming the Golf Links by *Tipula*, and said that the Rooks (*Corvus frugilegus*) were feeding extensively upon the larva of this pest.

*Lepidoptera.*—Mr. Newstead further recorded the capture of 70 species of Lepidoptera in one night, at the electric light, which had been specially fixed for attracting Moths by J. Henry Stock Esq., M.P., at his residence, The White Hall, Tarporley, several species of which were rare, and two new to the Society's district.

*Pisces.*—The Ballan Wrasse (*Labrus bergylta*, ASCAN.) had been taken at Colwyn Bay, and the Opah Fish (*Lampris luna*, GMEL.) at Rhos Neigr, North Wales.

The Second Meeting was held on April 11th, 1901, when Mr. J. Arkle delivered a Lecture entitled "Personal Observations on Insect Life." In this interesting Lecture Mr. Arkle drew attention to the fact that the study of insect life in this country does not receive the interest and encouragement it should; he thought this to be due to the comparative absence of insect pests in the country, and to the existence of insular prejudice.

Mr. Arkle traced the life history of insects through their several stages: the egg, the caterpillar, chrysalis to the perfect insect, making many comparisons and observations of great interest.

W. F. J. SHEPHEARD, *Secretary.*

## GEOLOGICAL SECTION.

Two Meetings of the Section have been held during the Session. At the first, on November 8th, 1900, the President (MR. J. D. SIDDALL) put before the audience some "Notes on the Geology of the North Coast of Anglesey," quoting some of the foremost geologists of the day to shew how varied were the opinions as to the exact classification of the rocks of the district. (Consult Quarterly Journals, Geological Society, August 1899, and May 1900, for Papers on recent investigations).

At the second Meeting, on March 28th, 1901, the Hon. Secretary of the Liverpool Geological Society (MR. H. C. BEASLEY) read a Paper on the "Conditions represented by the Lower Keuper," dealing with the physical and biological aspects, and explaining the difficulties in the way of correlation of the sparse *Fauna* of the period. MR. W. J. CLARKE, of Upton Park, afterwards read a Paper on the "Permo-Carboniferous Boundary," more especially touching on the light thrown upon the subject by recent borings at Sealand and elsewhere. The author concluded that, underneath the Wirral Peninsula and the Western portion of the Cheshire Plain, true Permian Rocks were absent; but that the Upper unproductive Coalmeasures probably attained a thickness of 1,700 feet, and the Lower Division of the Bunter 800 feet.

EGERTON GILBERT, *Secretary.*

## NATURAL PHILOSOPHY SECTION.

During the Session the following Lectures have been delivered under the auspices of the above Section:—

THURSDAY, OCTOBER 25th, 1900—**"Ancient and Modern Theories of Matter"**—MR. H. J. BAX. First Theories lost in Antiquity—Probably originated in India—Egyptians believed in a primal substance—Hence sought to transmute the base metals into gold—Their Chemistry a sacred profession—Greek Philosophers—Influence of Egyptian thought on their theories—Different Philosophers differ as to original substance—Dual development of Greek Theories—Ethically by one school; Physically by another—Rise of Alchemy—The Arabian Alchemy—Its invasion of Europe—The Philosophers' Stone—The Elixir Vitæ—Decay of Alchemy—Rise of Medico-Chemistry—Curious theory of man's body—Theory of Combustion or Phlogiston—Destroyed by Lavoisier's researches—The beginning of scientific study of matter—Dalton's Atomic Theory—Its development—Periodic Law—Elements—Nature and size of atoms—How grouped together into molecules—Liquefaction of gases—Discovery of new elements.

THURSDAY, FEBRUARY 14th, 1901—**"The Eye as an Instrument of Vision"**—MR. FOSTER SMITH, B.Sc. Value of the Sense of Sight—The Eye: its setting, and external organs—Motion of Eyeball, and controlling Muscles. Internal Structure—Coatings of the Eyeball—Retina—Crystalline Lens—Iris—Pupil—Cornea. Formation of Images by a Lens—Action of a Photographic Camera—Application to the Eye. Inversion of Image—Accommodation—Long and Short Sight—Spectacles. Binocular Vision—Corresponding points—Estimation of distance—Perception of relief—Stereoscope. Optical Illusions and their explanations. Colour Vision.

THURSDAY, APRIL 18th, 1901—**"Electric Car Systems compared"**—MR. J. A. MCMICHAEL, B.A., B.Sc. Superiority of Mechanical over Horse Traction—Classification of Electric Traction Systems—Conduit—Accumulators—Overhead or Trolley. Their advantages and disadvantages from a financial, æsthetic, and "Safety of the Public" point of view. Accidents explained and summarised. Fatal Accident Statistics—Electric Cars 1, Horse 2, Railways 6½. Leakage—its effect on water and gas mains—Steps to prevent it.

J. BAIRSTOW, *Secretary.*

## MICROSCOPICAL SECTION.

## "Methods of Photo-micrography," by Mr. A. E. GOODMAN.

By means of lantern slides the many makes and styles of both British and Continental Photo-micrographic apparatus were rapidly reviewed, and later, the various parts, and their uses, of a modern microscope were described. It was shown that, whilst all the mechanical contrivances and optical arrangements associated with the complicated microscope of to-day were most helpful, when properly manipulated, to the microscopist it was the objective, after all, which was the one part above all others, which needed the greatest care in selection; for upon the objective depended the amount of detail in any given object which would be visible through the microscope.

The defining power of a given lens was shown to depend upon the number of "spectral images," or "diffraction spectra," formed by the object under examination, and admitted or collected by the objective and passed into the microscope tube. For the purpose of illustrating the nature of these spectral images, a number of gratings of very fine and closely placed lines produced photographically upon glass had been prepared. Each grating was of a double nature, similar to the one shown in Fig. 1, but more extended, and the lines very considerably closer and finer.

On viewing a point of light through such a grating, the source of light appeared as a central beam bounded on either side by a regularly spaced series of diffraction images which decreased in brightness as they receded from the central beam, and were *twice* as numerous when viewed through the *wide*, as when viewed through the *narrow* spaces. The positions of the spectral images and central beam when viewed through such a grating are indicated in Fig. 2. This appearance or formation of diffraction spectra occurs in the same manner when working with the microscope; and in order to further explain the working of an objective some of Dr. Abbé's experiments were described in detail. A scale similar to Fig. 1 is prepared on a glass slip, the coarser lines being about 1,500 to the inch; when this is placed in the field of a suitable objective and focussed, a double series of diffraction spectra are produced, as shown in Fig. 2, and which may be seen on removing the eyepiece of the microscope and looking down the tube. By placing above the back lens of the objective discs of metal pierced by various slits, any set of these spectra may be allowed to pass up the tube, and the others shut off. In this way the upper series of diffraction spectra may be made to resemble the lower series in Fig. 2. When the light admitted by such a disc (Fig. 3 A) is examined through the eyepiece, the appearance presented is that shown in Fig. 3 B, where the grating appears to consist throughout of narrow lines—the lines in the upper part of scale having been doubled by shutting off the alternate diffraction spectra.

By arranging the slits in another disc (Fig. 4 A) further apart, so that the fourth spectral images on each side of the upper series and the corresponding second images of the lower series only are admitted, along with the central beams, the whole of the lines are again doubled in number (Fig. 4 B).

Whilst in the case where a disc is employed having a central slit only, so that no spectral images whatever are admitted (Fig. 5 A), no image at all of the lines of the scale is formed (Fig. 5 B).

From these experiments it may be inferred:—

1st—The direction of the lines forming the image will be at right-angles to the spread of the diffraction spectra;

2nd—The formation of an image at all depends upon the admission of at least one diffraction spectrum in addition to the central beam into the microscope tube;

3rd—The formation of a *correct* image depends upon the admission of the *whole* of the diffraction spectra.

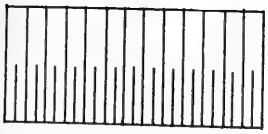


FIG. 1.

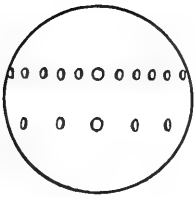


FIG. 2.

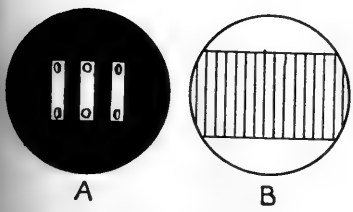



FIG 3.

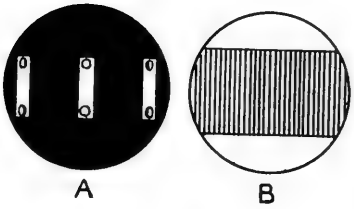



FIG. 4.

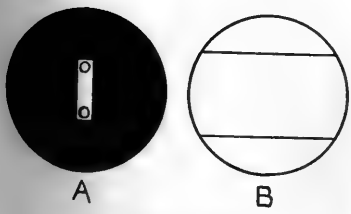



FIG. 5.

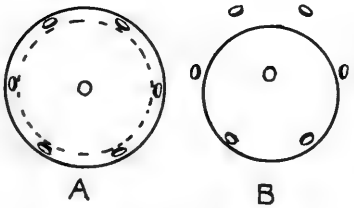
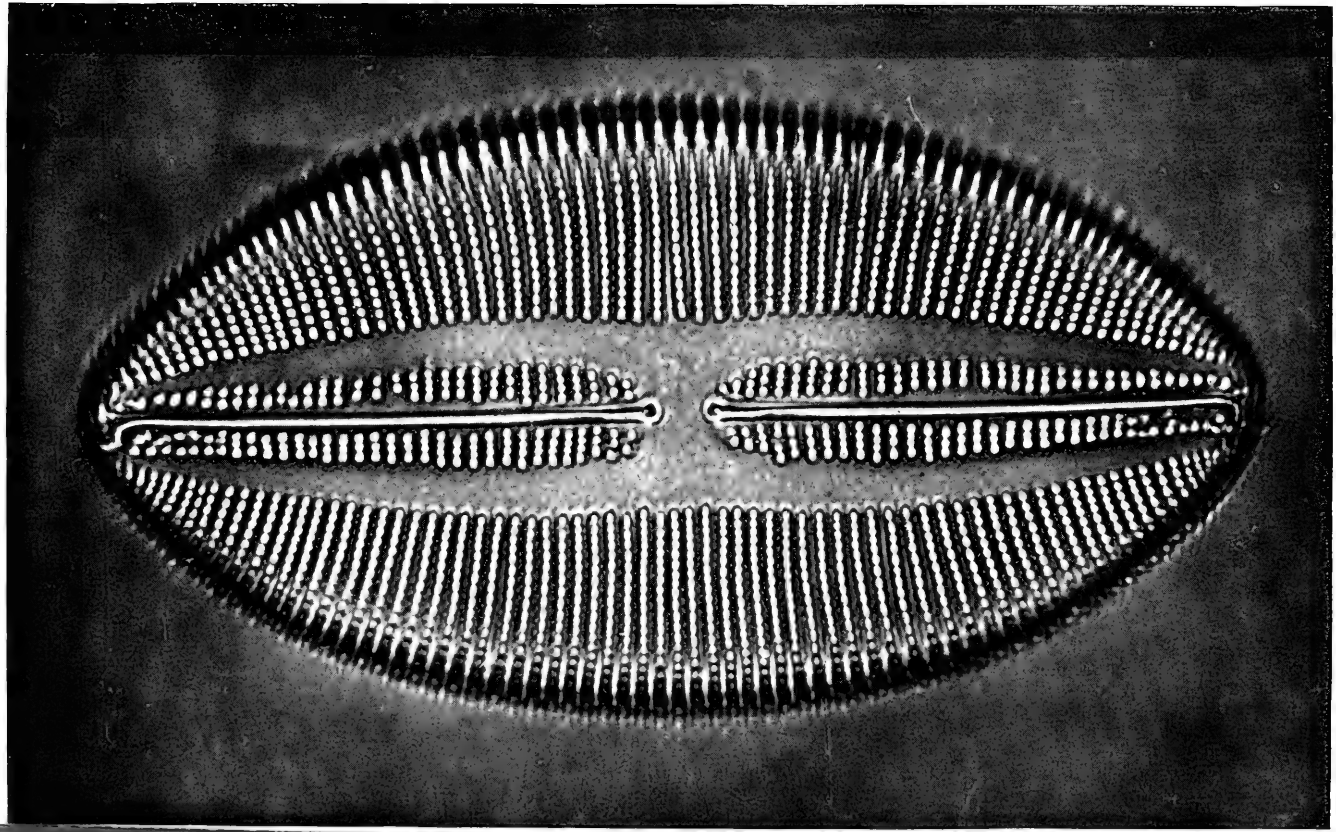



FIG. 6.



In proof of these, two microscopes were provided, each with a $\frac{1}{4}$" objective, one of which had a numerical aperture (N.A.) exceeding ·8, and the other an N.A. below ·8. The object for examination in both cases was a frustule of the diatom, *Pleurosigma angulatum,* the markings or striæ on which give rise to a series of diffraction spectra, arranged as shown in Fig. 6 A.

In the first microscope the N.A. of the objective was sufficiently great to admit the whole of these spectra, with the result that the characteristic hexagonal markings were distinctly seen through it. In the second microscope, the N.A. of the objective (indicated by the dotted line in Fig. 6 A) was too small to admit the spectral images, so that no trace of any markings could be discerned on looking through the microscope.

It is well known to microscopists that an inferior $\frac{1}{4}$" objective, such as the one last mentioned, may be made to resolve, or show, these markings by manipulating the light, and employing oblique instead of axial illumination.

The explanation of this is illustrated in the diagram B of Fig. 6. By causing the beam of light to strike the diatom obliquely, the whole of the spectra and the central beam are displaced with regard to the front lens of the objective, so that two of the diffraction spectra and the central beam are caught by the objective. As any pair of these three rays give rise to a distinct set of lines at right-angles to their own position, three sets of lines at an angle to each other of 60° are formed, producing the characteristic appearance of the striæ of this particular diatom. As only two, however, of the six spectra are admitted, the striæ cannot be so strongly resolved by this method as by the employment of an objective of the proper N.A.

In addition to numerous examples of photo-micrographs taken in the ordinary way with microscopic objectives, and various methods of illumination, several others of somewhat larger objects—such as Geological Sections, whole insects, &c.—were projected on the screen, which had been photographed by an ordinary camera lens without the employment of a microscope. The apparatus employed and the method of taking these photo-micrographs were exhibited and explained.

DESCRIPTION OF PLATE.

A reproduction of a direct print from an enlarged negative made from a photo-micrograph of the frustule of the diatom—*Navicula lyra. var.*

A print from the original negative was reproduced (Fig. 2) in last year's Proceedings.

Some idea of the actual size of the object may be gathered from the fact that its presence could not be detected if placed in the human eye—

| | |
|---|---|
| Lens employed ..... | Watson's $\frac{1}{12}$" oil im. of N.A. 1·25. |
| Eyepiece ,, ..... | None. |
| Condenser ,, ..... | Watson's Achromatic, N.A. 1·0. |
| Illumination ..... | Oil lamp—Axial. |
| Exposure ..... | 6 mins. |
| Plates ..... | Ilford Chromatic—backed. |
| Original magnification..... | 500 diameters. |
| Enlarged negative ..... | $4\frac{1}{2}$ times original. |
| Total magnification ..... | 2,250 diameters. |

## PHOTOGRAPHIC SECTION.

The Photographic Section has met six times during the past year—

1900.

Nov. 22—"Pictorial Photography." Lecture by MR. WALTER SCHRÖDER (Illustrated by the work of a few Members).

Dec. 17—The "Amateur Photographer" 1900 Prize Slides.

1901.

Feb. 21—"Photography" Prize Slides.

Mar. 5—"Film Development," by MR. FROMONT & MR. S. M. WEBSTER.

April 2—"Platinotype Printing," by MR. J. A. MCMICHAEL, B.A., B.SC.

„ 30—"Carbon Printing," by MR. S. MATHER WEBSTER.

The following awards have been gained by Members of the Section since the publication of the last Report:—

**Silver Medal.**—Lantern Slide Competition, "Amateur Photographer," to MR. A. E. GOODMAN for his Sundew Series.

**Bronze Medal.**—Lantern Slide Competition, "Photography," to MR. A. E. GOODMAN for the same.

**Bronze Medal.**—Lantern Slide Competition, "Photography," to MR. A. E. GOODMAN for Photo-Micrographs.

**Bronze Medal.**—Aintree Photographic Society, to MR. J. A. MCMICHAEL for Portraiture.

MR. A. E. GOODMAN also exhibited at the Royal Photographic Society's Exhibition.

JOHN A. MCMICHAEL, *Secretary.*

## LITERATURE SECTION.

At the Meeting of this Section on December 13th, 1900, MISS MONTGOMERY, B.A., read a most interesting Paper on the "Life and Works of Charlotte Brontë."

H. G. PHILLIPSON, B.A., *Secretary.*

## ASTRONOMICAL SECTION.

The two evenings allotted to our Section were filled as follows:—

1900.

Nov. 29—"The Solar Eclipse of May, 1900," by THE SECRETARY.

1901.

Mar. 14—"The Lesser Light—the Moon, her Scenery, and her History," by DR. WHICHELLO.

A few of the Members of the Section are working steadily, though quietly, and contribute Papers to the different Periodicals specially devoted to the branches of Astronomy, in which they are interested.

F. W. LONGBOTTOM, *Secretary.*

## GUILD OF ARTS AND CRAFTS. (ART SECTION).

During the year 1900, the Members of the Guild undertook the arrangement of two Exhibitions, both of which were well attended and aroused considerable local interest.

The first of these was opened on February 21st, by LORD KENYON, and consisted of works of Decorative and Applied Art, and for which a number of exhibits were entered by Members of the Guild and local craftsmen. The interest of the show was largely increased by the inclusion of a loan collection of objects of considerable artistic value, and the thanks of the Society are due to those persons who so kindly lent their collections for this purpose.

The second Exhibition, opened on the evening of the Annual Conversazione, October 17th, consisted of Paintings in Oil and Water-colours; a large majority of the exhibits being the work of Members of the Section, a few additional pictures of local interest being also included.

Both Exhibitions remained open for a period of one month.

In conclusion, it may be well to remind the members of the Society generally that membership of the Guild is open to all local Artists, either Painters or Craftsmen, and to ask everyone to do their best to increase the numbers by advertising this fact.

Names of new Members for this Section should be sent in to the Hon Secretary of the Section—MR. W. SCHRÖDER.

## PAXTON SOCIETY.

Marked progress has been made in all directions during the past year. The Membership has been considerably increased, as well as the list of Donors to the Prize Fund. The Entries for the Annual Exhibition of Fruits and Chrysanthemums exceeded those of any previous year; and the Exhibits were of a higher standard, and perhaps more representative in character than those of previous Exhibitions. Information continues to be received from Country districts that increased attention is being given by Cottagers and others to the cultivation of Hardy Fruits—Apples and Pears in particular—this being chiefly due to the encouragement given, and the information disseminated by this Society since its formation about twelve years ago.

The following Papers were read during the Winter Session in the Grosvenor Museum :—

1901.

Jan. 5—Social Gathering of Members.

,, 19—"Manures—Organic and Inorganic, Special and General—and their effects upon Crops," by MR. WM. NEILD, F.R.H.S.

Feb. 9—"The Cultivation of the Vine in houses constructed for Plant Culture," by .. .. .. MR. JNO. JACKSON.

,, 16—"The Commercial aspect of Apple and Pear Culture," by MR. G. P. MILN.

Mar. 2—"Curiosities of Plant Life" (Illustrated by 100 Lantern Slides), by MR. J. D. SIDDALL.

,, 16—"The Food and Habits of some useful British Birds" (with Lantern Illustrations), by .. MR. R. NEWSTEAD, F.E.S.

N. F. BARNES, *President.*
G. P. MILN, *Hon. Secretary.*

## NOTES BY Dr. W. HENRY DOBIE.

*Chelidon urbica.*—An example of a colony of Martins building on the face of a rock may be seen at Llandudno, on the east side of the Great Orme's Head, and the nests being constructed of reddish clay shew rather conspicuously against the grey lime-stone. Most of them are about 25 feet above the sea, underneath a broad projection of rock, which makes them quite inaccessible from above.

*Phalacrocorax graculus.*—A specimen of the Shag was brought in alive in a starved condition, but not wounded, to Mr. C. R. T. Congreve, at Burton Hall, on February 5th of the present year, having no doubt been blown in by a recent storm. It proved to be a female in mature plumage, and is the first record for Cheshire.

*Mergulus alle.*—On November 27th, 1900, a specimen of the Little Auk was brought to Hutchinson's from Tattenhall, where it had been procured by Mr. Bennett of that place.

*Podicipes griseigena.*—I am sorry to have to throw doubt upon the identity of a supposed specimen of the Red-necked Grebe in a case of stuffed birds belonging to Mr. Lewis Jones, of Hilbre Island, where it was shot (see Coward and Oldham's "Birds of Cheshire"). On a visit there last October it appeared to me from its size and markings to be a small immature specimen of the Great Crested Grebe *(Podicipes cristatus)*, and this was confirmed by a note from Mr. Howard Saunders to whom I sent a sketch of the head and neck.

## NOTES BY MR. J. ARKLE, 1900.

FLOWERS IN BLOOM, SPRING.—The frost and snow in the first half of February, and so frequently in March, made vegetation late—particularly in the case of almond and pear blossoms which only appeared about the end of April, or six weeks later as compared with 1899. The snow-drop was also delayed well into February, and the crocus and primrose well into April. Sallows—April 16th (17 days late). Warm spring weather commenced April 19th, and vegetation began making up for lost time. Blackthorn, cherry, in bloom—May 8th. Apple, sycamore—May 12th (8 days late). Lilac—May 19th (6 days late). Horse-chestnut—May 25th (12 days late). Hawthorn and laburnum—May 27th (14 days late). Lime trees had almost a complete rest after the luxuriant bloom of the preceding summer; their flowers were so few as almost to pass unnoticed. On November 3rd, a couple of white dog-roses were taken from a hedge in Lache Lane—an extraordinary tribute to the mildness of the prevailing weather. Trees in leaf—it was a close race between the oak and the ash, the oak winning by not more than two or three days.

BIRDS.—I did not see swallows till April 27th, when I observed martins as well. Mr. Powell, Verger of St. John's Church, takes great interest in the swallows building from year to year in the Church Porch; he observed their return about 9 a.m. on the morning of April 18th. Swifts appeared in their old haunts, May 4th—three days earlier than last year. Cuckoo and corn-crake heard May 7th—five and three days late respectively. Swifts suffered much by the high gales and thunderstorms which occurred from August 3rd to August 7th; on the latter date, Mr. Thompson, of 24, South View, Sealand Road, picked up a couple of dead ones in Handbridge. The remaining swifts left us on August 20th—two days earlier than last year. Swallows and martins, which usually stay about a couple of months longer, disappeared on October 12th.

INSECTS.—The summer, all over the country, was an exceptional one for *Lepidoptera*. Species were observed, which were either marked "extinct," or of rare or "periodical" occurrence. Amongst the latter we had a visitation of *Colias Edusa*—a large, rich deep-yellow butterfly, with broad black borders to the wings—along the Cop and adjacent fields, from August 17th to September 9th. I have evidence to show that some, if not all, of these species are with us always—circumstances, climatic and otherwise, merely contributing occasionally to their exceptional numbers. Worn specimens of *Cænonympha davus=typhon* were captured in July on Abbot's Moss; and the brilliantly-coloured moth *Zygæna filipendulæ* was exceptionally abundant (July 14th) on the Delamere heaths, as well as the little, blue, silver-spotted butterfly *Lycæna Ægon*. Black *Aplecta nebulosa* were reared by the Messrs. Thompson, from Delamere Forest caterpillars; and *Eupithecia castigata*, and the tiny chocolate-coloured plume-moth *Pterodactylus bipunctidactylus*, were abundant at flowers of the hogweed.

I took the following species at the City Electric Lamps, all new to the immediate district:—

*Heliothis marginatus*, *Xanthia gilvago*, *Hydræcia petasitis*, *Calamia lutosa*, *Nephoptera spissicella=roborella*. One specimen of the rare *Aplecta occulta* was captured, August 28th, by Mr. W. Hargreaves ("Mr. Cattermole") of *The Private Secretary Company*, then playing at the Royalty Theatre, Chester.

## BOTANICAL NOTES—BY Mr. A. E. GOODMAN.

The exceptionally cold and wet July and August of 1900, followed by the much warmer autumn, had a curious effect upon a great many plants. They seemed to have been completely deceived in the seasons, and behaved in September and October as though it were April or May, bursting their winter buds, and clothing themselves in an array of young shoots, leaves, and in several cases even flowers. A few of the more remarkable cases I noted with the dates, which I give below :—

*September 2nd*, 1900—Larches, in most localities near Chester, with well-developed young shoots and leaves.

*September 7th*—A plant of the Clematis (*C. jacobea*) in front of my own house had commenced growing new shoots, which later on bore buds, two of which eventually expanded feebly.

*September 22nd*—Found common Bryony (*B. dioica*) and many Hollies in flower.

*October 18th*—Saw plant of *Daphne mezereon* bearing large numbers of flower buds, which never expanded.

*November 28th*—Laurustinus and Jessamine in full bloom in several localities.

*December 16th*—Sweet Violets in full flower; they were growing in a neglected garden and somewhat protected by long grass.

## SNOW CRYSTALS—BY Mr. A. E. GOODMAN.

On January 8th and 9th, 1901, during the falls of snow, I noticed several showers where the snow fell in single crystals. On the 8th, the crystals were unusually large, and their beautiful hexagonal forms were plainly visible to the naked eye. Several I measured were one-twentieth of an inch in diameter.

On the 9th, the shower of crystals was soon after noon, and again they were abnormally large, two or three being one-fifth of an inch; whilst the average of some twenty-four taken at random was slightly over one-tenth of an inch. The crystals were not, however, so beautiful as those which fell on the previous day, their delicate forms being masked by an enveloping deposit of what appeared like hoar-frost. The hexagonal form was distinct, however, in every case. The large size of the crystals was, no doubt, due to the deposition of hoar-frost. I endeavoured to make photo-micrographs of some of these crystals, but was not very successful; the chief difficulty being to get the microscope and other accessories sufficiently cold to keep the delicate crystals from thawing.

## The Permo-Carboniferous Boundary, and what we learn about it from the Sealand and Thurgarton Boreholes, By Mr. W. J. CLARKE.

THE difficulty of drawing a dividing line between the Permian and Carboniferous formations has for some years occupied the attention of geologists, but has come into especial prominence lately, owing to the remarkable amount of fresh information recently collected by the officials of the Geological Survey—notably by Mr. Gibson and colleagues in North Staffordshire, and Mr. Cantrill in the Forest of Wyre Coalfields.

Professor Hull, in his celebrated memoir on the "Permian and Triassic Rocks of the Midland Counties," had recognised that the strata of this Midland region, which lay between the coal-bearing beds and over-lying Trias, were not of the same type as the true Zechstein Permian Rocks of

the North of England, and therefore provisionally placed them in a separate class which he called "Permian Rocks of Salopian type"; regarding them, however, as strictly contemporaneous with the true Zechstein Permians of the North of England.

These beds are everywhere found to contain fossils of pure Carboniferous type, besides thin zones of coalmeasures at different horizons in which thin but unworkable coal seams are found. The great mass of the strata consists of thick beds of red and mottled marls, interspersed between layers of fairly thick sandstones, gritty, calcareous, and conglomeratic towards the base, but finer and of a reddish and purple colour towards the summit.

These upper unproductive coalmeasures attain a very high development in North Staffordshire and Denbighshire, and their correlation—I may even say identity—has been established in a Paper read before the Geological Society on the 20th instant by Mr. Walcot Gibson, F.G.S.

The following Tables show the correlation:—

| North Staffordshire. (Walcot Gibson, F.G.S.) | feet. |
|---|---|
| Keele and Penkhull sandstone series | 300 |
| Newcastle-under-Lyme coal series | 300 |
| Etruria marls and gritty sandstones | 1,100 |
| Blackband series coal and ironstones | 500 |
| | 2,200 |

| Denbighshire. (D. C. Davies, F.G.S.) | feet. |
|---|---|
| Whittington and Erbistock red sandstones | 620 |
| Ifton Rhyn coal series | 300 |
| Green rocks, grits, conglomerates and marls | 600 |
| Thin coals, red and blue rocks | 220 |
| | 1,740 |

Absolute uniformity in the distribution of these zones of marls, sandstones, limestones, and coal-bearing beds is not to be expected, and will not be found, especially when traced from south to north; but with a typical section like that given by Mr. Gibson, of North Staffordshire, a standard is set up which will form an excellent guide to geologists and mining engineers.

Another point which I wish to emphasise is that the colour of the contained shales and marls varies considerably from district to district, and from zone to zone in the same district; chemically, the difference between the blue, green, and red marls is due to the latter containing 9 per cent. of peroxide of iron, and the former none; but I wish to suggest that the real reason of the difference is entirely of another order—namely, the source of supply whence their material was derived.

In regions adjoining Old Red Sandstone red marls predominate, and near Silurian districts, blue; whereas further north, where the Millstone grit and Yoredale rocks are in proximity, these coloured marls, though not quite extinguished, become quite subordinate, and sandstones, grits, and grey shales come more in evidence, as though lower Carboniferous strata had been the source of derivation.

The fact that these strata everywhere contain Carboniferous fossils plainly marks their stratigraphical position as being below, and not contemporaneous with true Zechstein Permian.

But in addition to this, still more direct evidence is furnished by the Thurgarton borehole, near Nottingham, where the true Permians are found to immediately overlie beds of the same lithological character as those found at Keele; and after these latter are penetrated, a coal series similar to that at Newcastle-under-Lyme is met with; for full particulars of which consult Mr. Gibson's Report in the "Annual Summary of Progress of the Geological Survey of the United Kingdom for 1899," p. 110.

But it is well known to mining engineers that of the faults affecting coal-bearing strata, some are pre-Permian and others post-Triassic; and that the horizon at which the former cease to affect the strata, forms (for engineers) a far more serviceable datum line than any drawn from palæontological evidence only.

Taking as our datum line the horizon thus indicated, and proceeding to the Southern Midlands and still further south, we find a series of beds into which faults affecting Upper coal-measure strata do not appear to penetrate—namely, the Permian breccia of Worcestershire, the dolomitic limestone of Bristol and Somerset, and possibly the higher of the two calcareous beds in the Enville district. Judged by this test, we shall probably find that we have a certain series of beds which still fall under Prof. Hull's original classification (Permian beds of Salopian type); though, owing to the similar lithological characters of the two formations, a very large proportion of coal-measure strata was formerly wrongly included in this class.

As, however, none of these beds nor beds of Zechstein are indicated in the Sealand borehole, near Chester, of which a section is here given below:

SEALAND BOREHOLE, NEAR CHESTER.

| | Thickness. ft. | in. | Depth. ft. | in. |
|---|---|---|---|---|
| Estuarine and glacial .. .. .. | 79 | 6 | .. 79 | 6 |
| Bunter sandstone .. .. .. .. | 859 | 6 | .. 939 | 0 |
| Upper Coal Measures:— | | | | |
| Red and grey shale with sandstone .. | 32 | 0 | | |
| Limestone .. .. .. .. | 3 | 6 | | |
| Red shales .. .. .. .. | 26 | 0 | | |
| Grey sandstone .. .. .. .. | 59 | 6 | | |
| Grey limestone and spar .. .. | 1 | 0 | | |
| Grey sandstone .. .. .. .. | 17 | 6 | | |
| Limestone .. .. .. .. | 1 | 0 | | |
| Grey sandstone—calcareous .. .. | 2 | 0 | | |
| Limestone .. .. .. .. | 1 | 0 | | |
| Grey sandstone and shale .. .. | 23 | 6 | | |
| Red sandstone .. .. .. .. | 15 | 0 | | |
| Grey sandstone .. .. .. .. | 15 | 0 | | |
| Red and grey sandstone .. .. | 22 | 0 | | |
| Purple and blue shale .. .. .. | 104 | 3 | | |
| Dark grey and purple sandstone .. | 44 | 9 | | |
| Purple and blue shale .. .. .. | 3 | 6 | | |
| Grey limestone with black partings .. | 2 | 0 | | |
| Purple and blue shale with purple sandstone .. .. .. .. | 69 | 6 | | |
| Reddish grey limestone .. .. | 1 | 0 | | |
| Purple and blue shale with ironstone .. | 19 | 6 | | |
| Dark grey sandstone .. .. .. | 45 | 6 | | |
| Reddish grey sandstone .. .. | 76 | 4 | | |
| Shale with reddish grey sandstone .. | 24 | 2 | | |
| Limestone—shaly in part .. .. | 16 | 0 | | |
| Red and mottled shale containing ironstone .. .. .. .. | 72 | 8 | | |
| | 1,637 | 2 | | |

and as Mr. De Rance has pointed out, no Zechstein Permian are elsewhere found south of a line drawn from Birkenhead to Nottingham, I think we may fairly conclude from the evidence that no Permian rocks, of either Zechstein or Salopian type, are likely to be met with in either Wirral or the western portion of the Cheshire plain.

In passing, I wish to remark that it was a Chester gentleman, Mr. William Shone, F.G.S. (a Member of this Society), who had the honour of first determining the Carboniferous age of the deposits found below the Bunter rocks in this borehole.

Now, at the Bold Hall and Collins Green Collieries, situated about halfway between St. Helens and Warrington, a series of Upper Carboniferous strata are met with, not at all comparable to those found in this Sealand borehole; this latter section being more nearly allied to the Farnworth borehole and the Manchester district.

The thickness of these Upper Coal strata at Bold and Collins Green is about 1,200 feet, of which the uppermost portion very much resembles the measures found in a borehole at Sandycroft, situated about seven-eighths of a mile south-west of the Sealand borehole, and which I consider are on a lower geological horizon than this last. By adding the thickness of the measures proved at Sealand to those of Bold or Collins Green, we arrive at the sum of 1,700 feet as the thickness of the Upper unproductive series in this district; an estimate I believe to be approximately correct.

The section that can, as far as my knowledge extends, be best correlated with the Sealand borehole is that of the clay hole of the Abenbury Terra-cotta Works, at King's Mills, near Wrexham; the similarity of the purple marls, the grey sandstones, and the purple micaceous sandstones is certainly remarkable, and I am disposed to place them on the same horizon. These strata were classed by Professor Hull with the Permians of Salopian type, and seem to be identical with the beds found at the summit of the Keele series, at the Newstead Boring near Trentham, in North Staffordshire, where the thicknesses of Upper Coalmeasure strata has been proved to be 1,946 feet; a fact that corresponds very closely with the estimate formed by comparing the Sealand section with those of Sandycroft, Bold, and Collins Green.

As the lower subdivision of the Bunter is here 800 feet, we get a total of 2,500 feet as the depth to the productive coalmeasures; but it does not follow that, in properly selected localities, a much less thickness of both formations may not obtain.

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Reprints from "Zoologist," by C. Oldham. *The Author.*
Birds—British, by Edward Saunders (2nd Edition), 1901. *Mr. John Day.*
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The Great Auk or Garefowl—its History, Archæology, and Remains—by Symington Grieve, 1885. *Mr. George Frater.*
Human Remains from the Saltney Boulder-Clay (Pamphlet). *Mr. R. Newstead, Curator.*
The Injurious Scale Insects and Mealy Bug of the British Isles. *Mr. R. Newstead, Curator.*
Journal of the Society of Chemical Industry—years 1898-99; Index for the years 1882—96. *Mr. E. G. Ballard.*
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Four original Plan Drawings of Coal Borings, by W. J. Clarke. *By the Author.*
Publications of the Canegie Museum, and Report.
Report of the British Association for the Advancement of Science, 1900.
Report of the Smithsonian Institution, 1899.
Society of Chemical Industry—years 1898-99; 1 Collective Index, 1898-99; 1 Vol. XV., 1896. *Mr. E. G. Ballard.*
Structure and Life of Birds, by Heardley. *Mr. J. Lyon Denson.*
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Naturalists' Journal, by C. Mosley. *Mr. Brocton Tomlin, M.A.*
Wild White Cattle (Reprint from "Zoologist"). *Mr. Chas. Oldham.*

BY EXCHANGE.

The Alga Flora of Yorkshire, by W. West and B. West.
Boletin del Instituto Geologico de Mexico, 1900.
Food of the Bobolink, Blackbirds, and Grackles, by F. E. Beal, B.S.
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North American Fauna.
Proceedings of the Bristol Naturalists' Society, 1899.
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" " Literary and Philosophical Society of Liverpool, 1899-1900.
Report and Transactions of the Guernsey Society of Natural Science and Local Research, 1899.
Report of the Liverpool Microscopical Society.
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Bolland, Mrs. ..... 46 Hough green
Bolland, Mr. Frank ..... " "
Bonnalie, Mr. G. S., L.D.S., R.C.S. .. Upton, Chester
Bonnalie, Mrs. ..... " "
*Bonnalie, Mr. Fredk. J., L.D.S., R.C.S. .. 4 Abbey square
Bonnalie, Mrs. ..... " "
Booley, Miss ..... 74 Bouverie street
Bourne, Mrs. ..... Golden grove, Hoole
Bowers, Mr. H. R., J.P. ..... Hawthorne villa, Hoole road
Bowers, Mrs. ..... " "
Bowers, Miss M. ..... 35 Liverpool road
Bowles, Mr. T. S. ..... The Limes, Liverpool road
Bowyer, Miss Edith ..... 5 Crane street
Box, Mr. Henry ..... 46 Frodsham street
Boyson, Miss Annie H. ..... 28 Macaulay road, Clapham Common, London, S.W.
Bracegirdle, Miss ..... 41 White friars
Bradbury, Mr. R. P. ..... Walmore, Dee banks
Bramall, Mr. G. H. ..... 4 Nicholas street
Brassey, Miss ..... Rose Hill, Bowdon, Cheshire
Brassey, Mr. Herbert ..... The Limes, Curzon park
Brassey, Mrs. ..... " "
Brewer, Miss E. ..... 15 Paradise row
Brewer, Miss Anne ..... " "
Bridge, Dr. J. C., M.A. ..... Christ Church Vicarage
Bridge, Mrs. ..... " "
Bridge, Miss ..... " "
*Broadbent, Mrs. ..... Bache Cottage
Brock, Mr. Frank ..... Eaton Gardens, Chester
Brown, Miss L. E. ..... The Folly, Flookersbrook
*Brown, Mr. F. F., M.A. ..... Eastgate row
Brown, Miss ..... 61 Bouverie street
Brown, Miss Daisy ..... " "
Brown, Mr. W. E. ..... 33 Parkgate road
Brown, Mrs. ..... " "
Brown, Mrs. H. T. ..... Roodeye House, Chester

Buckland, Miss.....31 Nicholas street
*Buckler, Rev. J. F., M.A. .....Bidston Rectory, near Birkenhead
Buckley, Mr. Wm. Ireland, F.R.G.S...Weaver View, Winsford, Cheshire
Bullin, Mr. F., L.D.S., R.C.S., J.P...20 Nicholas street
Bullin, Mrs. ..... " "
Bullin, Miss E. ..... " "
Bull, Mr. H. F.....4 Sunny bank, Queen's park
Bull, Mrs. ..... " "
Burrell, Mr. T. G.....119 Foregate street
Burrows, Mr. R. .....Railway Inn, Brook street
Burness, Mr. Wm.....Parr's Bank, Ltd., Chester
Burnett, Miss Eleanor .....27 South Road, Devonshire Park, Birkenhead
Butcher, Mr. Jas. .....20 The Groves
Butterworth, Mr. Robt. .....19 Bouverie street

Caldecott, Miss C. G. .....19 Pepper street
Campbell, Mrs. Pitcairn .....Vicar's Cross, Chester
Campbell, Mr. A. D. Pitcairn.... " "
Caröe, Miss.....The Gables, Flookersbrook
Carr, The Hon. Mrs.....131 Boughton
Carr, Mrs. Thos. .....Fuller's Moor, Broxton
Carter, Mr. T. .....Chemist, Boughton
Cartwright, Mr. J P. .....Pool House, Flookersbrook
Cestria, Miss Louise.....Bridge street row, W.
Challinor, Mr. R. .....32 Eaton road
Chalton, Mr. T. W. .....Wynstay, Hoole, Chester
Chalton, Mrs..... " "
Chapman, Mr. F. W. .....42 Tarvin Road
*Chester, The Right Rev. The Lord Bishop of } The Palace, Dee Side
Churton, Mrs. G. .....92 Watergate flags
Clark, Mr. Sidney .....Upton Villa
Clark, Miss Sybil .....Stanley house
Clark, Miss.....19 Grosvenor street
Clark, Miss Eva..... " "
Clarke, Mr. John .....Pasadena, Liverpool road
Clarke, Mr. W. J.....The Beeches, Upton park
Clarke, Mr. Ernest ..... " "
Clare, Mr. Horatio.....Grosvenor Schools, Chester
Clemence, Mr. S. .....2 Chichester street
Clemence, Mr. Thos.....Rockend, 31 Cambrian view
Clough, Mr. G. F.....78 Hough green
Clough, Mrs. ..... " "
Cochrane, Mr. J. G. .....5 Abbots' Nook, Victoria Road
Cockrill, Mr. C. P. .....Briercliffe, Hough green
Cockrill, Mrs..... " "
Coe, Mr. D.....26 Lightfoot street
Coe, Mr. Henry J.....4 Bold terrace
Cogswell, Mr. Gerald, A.R.I.B.A. 20 Old Bank Buildings
Cohen, Mr. Eustace G.....11 Stanley place
Collinge, Mr. James .....Kinnerton Lodge, Chester
Coltart, Mr. C. B.....Wisbeach House, Glan Aber park
Connah, Mr. Jas. ..... } Government Laboratory, Clement's Inn Passage, London, W.C.
Conway, Mr. Walter.....8 and 10 Old Bank buildings
Cook, Mr. G. Mark .....13 Brook street
Cooke, Mr. J. H. .....6 Queen street
Coppack, Mr. Chas. .....Gladwyn, Liverpool road
Coppack, Miss ..... " "
Coppack, Miss Nellie ..... " "
Cordery, Miss C. ..... .....St. Agnes' School, Caldy, West Kirby
Crane, Mr. H. E. .....Savings Bank House, Grosvenor street
Crum, Mr. W. G., J.P.....Thornliebank, Glasgow

Cullimore, Mrs. ..... Christleton, Chester
Cummings, Miss A. F. ..... 6 King's buildings
Cummings, Miss Beatrice ..... ,, ,,

*Darby, Very Rev. J. L., D.D .... The Deanery
Darby, Mrs. ..... ,,
Darby, Miss ..... ,,
Darby, Mr. Alfred ..... Wren's Nest, Wrexham
Davies, Miss Henrietta ..... 69 Boughton
Davies, Mr. E. Henry ..... 19 Francis street
Davies, Mr. Joseph ..... ,, ,,
Davies, Mr. John ..... Parr's Bank, Limited, Chester
Davies, Mr. J. P. ..... 75 Crane street
Davies, Miss ..... St. Michael's School
Davies, Miss Nessie ..... Old Hall, Helsby
Davies, Mr. W. L. ..... Beechwood House, Canal street
Davies, Mrs. ..... ,, ,, ,,
Davies, Rev. J. T., M.A. ..... 6 Abbey green
Davison, Mr. Herbert ..... Brookside, Flookersbrook
Davison, Mrs. ..... ,, ,,
Day, Mr. John ..... Bryntirion, Chichester street
Day, Mrs. ..... ,, ,, ,,
Day, Mr. George ..... Eastgate street
Dean, Mr. J. T. ..... 8 Abbey street
Delany, Mr. John ..... 7 Lorne street (South)
Delany, Mrs. ..... ,, ,,
Dennis, Miss Ada ..... 47 Nicholas street
Denson, Mr. W ..... 21 Upper Northgate street
Denson, Mrs. ..... ,, ,,
Denson, Miss Adelaide ..... ,, ,,
Denson, Mr. J. Lyon ..... ,, ,,
Denson, Mr. W. H. ..... 3 Abbey Green
Denson, Mrs. ..... ,, ,,
Dickinson, Mr. D. ..... 1 Upton view, Hoole
Dickinson, Mr. D. T. ..... ,, ,,
Dickson, Mr. Geo. A., J.P. ..... Springfield, Flookersbrook
Dickson, Mr. J. H. ..... St. Ives, Queen's Park
Dickson, Mrs. ..... ,, ,,
Dickson, Miss ..... Upton House, Chester
Digby, Miss ..... 2 Grey friars
Digweed, Mr. Chas. S. ..... 39 Beaconsfield street
*Dobie, Dr. W. M., F.R.A.S., J.P. ... Hunter street
Dobie, Miss Mabel ..... ,, ,,
Dobie, Miss Mildred ..... ,, ,,
*Dobie, Mr. W. H., M.B. ..... 2 Hunter street
Dobie, Mrs. ..... ,, ,,
*Dobie, Dr. Herbert ..... 11 St. John street
Dobie, Mrs. ..... ,, ,,
Dobie, Mr. Douglas ..... Upper Northgate street
Dobson, Mr. R. ..... 39 Cotgreave terrace
Dod, Rev. C. Wolley, M.A., J.P. .. Edge Hall, Malpas
Dod, Miss Wolley ..... ,, ,,
Dodd, Mr. W. ..... 143 St. Anne street
Dodd, Mr. John ..... 35 Saughall road
Donald, Mrs. ..... The Cross, Chester
Donne, Miss ..... 14 Chichester street
Dowdall, Lieut.-Col. A. P. ..... Curzon park
Dowdall, Miss A. ..... ,, ,,
Drinkwater, Dr. ..... Wrexham
Ducker, Mr. P. J. ..... George street
Duckworth, Mr. Henry, F.L.S. F.G.S. .. 38 Liverpool road
Duckworth, Miss M. E. Theodora ..... ,, ,,
Duff, Dr. ..... 5 Abbey street

Dutton, Mr. George, J.P.....Curzon House
Dutton, Mrs. ..... ,,
Dutton, Mrs. G. W. .....Claremont, Vicar's Cross, Chester
Dutton, Mr. H. B.....Freshfield, 27 Curzon park
Dutton, Mrs. ..... ,, ,,
Dutton, Mr. Hugh T. ..... ,, ,,
Dutton, Miss M. .....4 Park street
Dutton, Mr. J. Rowe .....The Beeches, Saltney
Dutton, Mr. J. F. Harrison.....The Nook, Hamilton street, Hoole
Dutton, Mr. A. E. .....55 Frodsham street
Dye, Mr. Alfred B. .....72 Bouverie street
Dye, Miss Ethel ..... ,, ,,
Du Puget, Mrs. Michod .....Fernville, Curzon park

Edwards, Mr. F. G., M.R.C.V.S...5 Newgate street
Edwards, Miss .....28 Queen street
Eddy, Miss E. .....29 Bouverie street
Eggers, Miss .....42 Hough green
Egginton, Mr. R. H.....12 King street
Egginton, Mrs. ..... ,, ,,
Elliott, Dr. John, B.S., B.Sc. ..24 Nicholas street
Elliott, Miss ..... ,, ,,
Ellis, Mr. R. J.....60 Foregate street
Evans-Lloyd, Col., J.P. .....Stanley House
*Evans, Mr. F. .....The Eastgate
Evans, Mr. Geo. H. .....The Limes, Lumley road
Evans, Miss .....Roseneath, Wrexham
Ewing, Mr. C. A. .....Rockcliffe, Queen's park

Farmer, Mr. Richard .....36 Liverpool road
Farrimond, Mr. F. T. .....Sunnyside, Boughton
Fergusson, Mr. W. .....The Cairn, Liverpool road
Fergusson, Miss J. M..... ,, ,,
Ffoulkes, His Honour Judge Wynne, M.A...Old Northgate House
Ffoulkes, Mr. Thomas B., Junr...8 Burlington road, Ipswich
Ffoulkes, Mr. Geo. B.....15 Chichester street
Finchett-Maddock, Mrs. H. ....Cae Gwyn, Carnarvon
Firman, Rev. Septimus .....44 Great Mersey street, Liverpool
Fish, Mrs. .....Arnold House, Parkgate road
*Fish, Rev. A. H., B.A., B.Sc. .. ,, ,,
Fisher, Rev. O. P. .....74 Bouverie street
Fleet, Mr. H. .....35 Tarvin road
Fleming, Mr. T. R. .....Rowton Grange
Fleming, Mrs. ..... ,, ,,
Fletcher, Miss .....Woodbrae, Curzon park
Float, Mrs. S. M. .....20 Upper Northgate street
Fluitt, Miss .....42 Upper Northgate street
Footner, Mrs. .....Dee banks
Footner, Miss A. de B. .....Crypt Studio, Eastgate street
Forster, Mr. W. Angus .....Belgrave Lodge, Pulford
Franks, Miss .....5 Hunter street
Fraser, Mr. A. R. .....Rowton
Fraser, Mr. R. .....Greenbank, Eaton road
Fraser, Miss ..... ,, ,,
Frater, Mr. Jas. .....Stone Villa, Stone Bridge
Frater, Mrs. ..... ,, ,,
Frater, Mr. Geo. ..... .....Grey Holt, Summerhill, near Wrexham
Frater, Mrs. ..... ,, ,, ,,
Freeman, Mr. C. E. .....Grange road, Brook lane
Freeman, Mrs. ..... ,, ,,
Frisby, Miss .....16 Chichester street
Frith, Mr. Ernest .....Bellevue, Runcorn
Frost, Sir Thomas G., J.P.....Redcliff, Queen's park
Frost, Lady ..... ,, ,,

Frost, Mr. J. G., J.P. .....Boughton Hall
Frost, Mrs. ..... ,, ,,
Frost, Mr. J. M., J.P. .....Dee Lodge
Frost, Mrs. ..... ,, ,,
Frost, Mr. T. Gibbons. .....Mollington Banastre
Frost, Mrs. ..... ,, ,,

Gardiner, Miss .....23 Liverpool road
Gardner, Miss Monica F. .....33 Cambrian view
Gardner, Mr. E. .....9 Abbey street
Garner, Mr. T. .....61 Catherine street, Sealand road
Garnett, Mrs. .....The Rectory, Christleton
Garnett, Mr. H. A. .....Glasfryn, Llanfairfechan
Garnett, Mrs. ..... ,, ,,
Garside, Mr. Franklin .....14 Bouverie street
Garside, Mrs. ..... ,, ,,
Garside, Miss Ethel ..... ,, ,,
Gerrard, Miss. .....Fuller's Moor, Broxton
Gibson, Major .....Buckley, *via* Chester
Gibson, Miss .....5 Crane street
Gibson, Mr. John .....Wisbeach House, Glan Aber park
Giffen, Mr. J. T. M., F.R.C.S. ..Richmond Hill, Boughton
Gilbert, Mr. Egerton .....21 Eaton road
Gilbert, Mrs. ..... ,, ,,
Gilbert, Miss .....Egerton Villa, Liverpool road
Giles, Mr. E. S. .....Gowymede, Vicar's Cross
Giles, Mrs. ..... ,, ,,
Glascodyne, Miss .....4 King's buildings
Golder, Mr. S. .....41 Liverpool road
Golder, Mr. Jas. T. .....34 Eaton road
*Goodman, Mr. A. E. .....Oakdene, Tarvin road
Goodhart, Mrs. E. S. .....96 Watergate flags
Gore, Ven. Archdeacon .....Bowdon, Cheshire
*Granger, Mr. F. M., M.R.C.S., L.R.C.P. ..18 Nicholas street
Granger, Mrs. ..... ,, ,,
Grantham, Rev. H. .....S. Mary's Rectory
Gray, Miss .....6 Lorne street
Greenhouse, Mr. Chas. .....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S. } 31 Shrewsbury road, Birkenhead
Greig, Mrs. .....Anfield, Dee banks, West
Griffith, Mr. G. R. .....Grosvenor street
Griffith, Mr. G. B. .....22 Queen street
Griffith, Mr. T. H. .....35 Egerton street
Griffith, Mr. W. R. .....Rydal Mount, Upper Bangor
Griffiths, Miss .....2 Holly bank, Queen's park
Griffiths, Mr. John ..... ,, ,,
*Griffiths, Rev. T. T., M.A. ..... ,, ,,
Griffiths, Mr. W. A. .....West Hey, Hough green
Griffiths, Miss Bessie ..... ,, ,,
Griffiths, Miss .....88 St. Anne street
Grindley, Mr. J. .....3 Eastgate street
Gritton, Mr. Joseph. .....Elmdon, Newton lane
Gunton, Miss. .....Rimmersfield

Hallmark, Mr. J. B. .....Melville, Hoole road
Hamilton, Mr. A., M.R.C.S. ....16 White friars
Hamilton, Mrs. ..... ,, ,,
Hampson, Mr. R. .....Halkyn road, Flookersbrook
Hannon, Miss .....22 Newgate street
Hardy, Mr. J. E. .....Walpole street
Harris, Mr. T. .....Dee Hills park
Harris, Mrs. ..... ,, ,,

Harrison, Mr. N. .....Highfield, Curzon park
Harrison, Mrs. ..... ,, ,,
Harvey, Miss.....12 Panton place, Hoole
Haswell, Mr. G. H. .....Queen's park
Haswell, Mrs. ..... ,, ,,
Haswell, Mr. W. H. .....84 Foregate street
Haswell, Mr. Geo. W.....70 Bouverie street
Hawkins, Mr. J. M.....Glan Aber park
Haycock, Rev. H. E. .....59 Parkgate road
Heeley, Miss .....3 Cheyney road
Henderson, Mr. J. E. .....19 Pathway, Queen's park
Henshall, Mr. James, Junr.....Bouverie street
Henshaw, Mr. T. .....The Hollies, Liverpool road
Henshaw, Miss Florence M..... ,, ,,
Heppel, Miss .....16 Hough green
Heppel, Mrs.....Windsor Lodge, Mickle Trafford
*Hetherington, Mr. T. .....Engineers Department, The Post Office, Glasgow
Hewitt, Mr. David L. .....Abbey House, Northgate street
Hickey, Mrs. .....2 Victoria pathway, Queen's park
Hickman, Mr. F. F.....8 Northgate street
Higgins, Miss Eva .....The Manor, Overleigh
Higgins, Miss Millie..... ,, ,,
Higginson, Mr. T.....1 South view, Eaton road
Hignett, Mrs.....28 Hough green
Hignett, Mr. A. H. ..... ,, ,,
Hignett, Mrs. T. H.....Shandon, Hough green
Hilton, Mrs. .....Talbot Hotel
*Hilton, Mr. Rob. .....S. Mary's Cottage, Chester
Hincks, Mr. J. W. .....Brantwood, Brook lane
Hincks, Mrs. ..... ,, ,,
Hindhaugh, Mrs. .....Parkgate road
Hirst, Mr. John A. .....Oak Cottage, Upton
Hobday, Mr. J. .....Alexandra Villa, Liverpool road
Hobday, Mr. E..... ,, ,,
Hobday, Mr. Wm. Edward.....22 The Groves
Hodge, Mr. J. R. .....23 Liverpool road
Hodge, Mrs. ..... ,, ,,
Hodge, Miss Constance ..... ,, ,,
*Hodges, Mr. W. .....62 Hough green
Hodkinson, Mrs. .....39 White Friars
Hodkinson, Mr. E..... ,, ,,
Holding, Mr. Geo.....5 Belgrave street, Liscard, Cheshire
Holland, Miss..... .....11 Derby place, Hoole road
Holland, Miss.....Bryn-y-Grog, Wrexham
Holme, Rev. Canon, M.A.....Great Budworth, Northwich
Holmes, Mr. J. G., J.P. .....Belmont, Curzon park
Home, Miss R. .....1 Lumley road
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopley, Mr. J. H.....6 Northgate street
Hopton, Mrs.....3 Cheyney road
Hopwood, Miss .....The Deanery
Hornby, Mr. Alex. .....Wood Villa, Brook lane
Hornby, Mrs..... ,, ,,
Horner, Mr. W.....42 Grey Rock street, Liverpool
Hostage, Mr. George B. .....28 Eaton road
Hostage, Mrs. ..... ,, ,,
Hostage, Miss .....22 Eaton road
Howson, Rev. J. F., M.A. .....Egerton House, Upper Northgate street
Howson, Miss ..... ,, ,, ,,
*Howe, Rev. W. N. .....24 Castle street
Howard, Mr. T. H. .....16 Louise street
Howell-Evans, Mr. H. J.....Bridge street row, W.

Howick, Mr. T. S. Keith.....22 St. Martin's fields
Hudson, Mrs. R. S. .....Bache Hall, Chester
Hughes, Mrs. McKenny .....18 Hills road, Cambridge
Hughes, Mrs. Tom .....17 Hyde Park square, London, W.
Hughes, Mr. John.. .....47 Victoria street, Westminster, London
Hughes, Miss.....Wepre Cottage, Connah's Quay
Humberston, Miss.....Newton Hall, Chester
Humphreys, Mr. E. Noel.....Caer y Cael, Hoole
Humphreys, Mrs. .. ..... " "
Humphreys, Miss Lilian .....5 Hamilton street, Hoole
Hunter, Mr. Jas. .....Maisonette, Hough green
Hunter, Mrs. ..... " "
Hunter, Mr. Jas. de Graaff ..... " "
Hunt, Mr. J. L. .....50 Bridge street row, W.
Hutchings, Mr. J. Hanmer .....Tudor Lodge, 150 Boughton
Hutchings, Mrs..... " "
Hutchinson, Mr. Thos.....48 Frodsham street
Hutton, Rev. E. A., M.A. .....Hargrave Vicarage, Chester
Huxley, Miss M. E. .....41 Cheyney road
Huxley, Miss Ann..... " "

Jack, Mr. A. S.....Belle Vue, 72 Hough green
Jackson, Mr. Roger, J.P. .....52 Hough green
Jackson, Miss..... " "
Jackson, Mr. Robert .....8 Denbigh street
James, Rev. T. D. .....Athol House, Brook lane
*James, Rev. Frank, M.A. .....Rossett Vicarage, near Wrexham
*Jebb, Mr. G. R., C.E. .....Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S. } 2 The Northgate
Jepson, Mr. Arthur .....6 Walpole street
Johnson, Major .....2 White friars
Johnson, Mrs .....11 Bertram road, Sefton park, Liverpool
*Johnson, Mr. M., L.D.S.I. .....9 York villas, Lorne street
Johnson, Mr. Thomas C. .....Bod Asaph, Chichester street
Johnson, Mr. Noel .....Warwick Road Hall, Bowdon
Johnson, Mr. Sydney .....18 Bouverie street
Jolliffe, Mr. H. D.....Queen's park
Jones, Miss.. .....Lorne street
Jones, Mrs. Edward .....1 Derby place, Hoole
Jones, Mr. Jno. .....5 Lorne street (North)
Jones, Mr. David Brellisford ....11 St. Anne street
Jones, Mr. W. S. .....North and South Wales Bank
Jones, Mr. Owen E., J.P. .....Tynrheol, Amlwch
Jones, Mr. Fred. .....26 Frodsham street
Jones, Mr. H., A.C.A. .....14 Lord street
Jones, Miss.....2 Hunter street
Jones, Mrs. W. H. .....4 Abbey street
Jones, Miss F. Bannister ..... " "
Jones, Miss Gertrude A. ..... " "
Jones, Mrs. Evan .....Bodrenig, Bala, N. Wales
Jones, Mr. W. A.....Canal street
Jones, Mrs. Wm. .....Cuppin street
Jones, Mr. Henry .....94 Watergate flags
Jones, Mr. O. R., H.M.I.M. ....5 Spring Gardens, Hoole
Jones, Mr. Percy Barrett.....26 Upper Northgate street
Joyce, Rev. G. C., M.A.....St. Deiniol's Hostel, Hawarden
Joyce, Rev. F. Hayward .....9 Abbey square

Kelsall, Miss H.. .....Abbot's Court, Liverpool road
Kenyon, Mr. G. A., M.B. .....Flookersbrook
Kenyon, Mrs..... "
Killick, Mr. George .....Eaton, Chester

King, Dr. H. W. .....26 Nicholas street
King, Mrs. ..... ,, ,,
*Kingsley, Miss .....Keys, Eversley, Winchfield
Knight, Mr. .....Rhianfa, Bull Bay, Amlwch
Knight, Mrs. ..... ,, ,, ,,
Knight, Miss .....8 Eastgate row
Knowles, Mr. E. R. .....Grosvenor street
Kynnersley, Mr. E. M. Sneyd ..Boughton Lodge

Lacy, Mrs. .....Moore Holme, Neston
Laing, Miss S. C. .....7 Chester street, Saltney
Lamont, Mr. A. .....City Walls, (West)
Lamont, Miss ..... ,, ,,
Lanceley, Mr. R. H. ..... Victoria road
Latham, Mr. J. S. .....Green bank, Liverpool road
*Lawrence, Dr. A. .....The Asylum, Chester
Laybourne, Mr. J. H. .....21 The Groves
Laybourne, Mrs. ..... ,, ,,
Leader, Miss .....4 King's buildings
Ledsham, Mr. Wm. .....Coal Exchange
Lees, Mr. W., M.R.C.S. .....The Bars
Leete, Mrs. .....Vicarage road, Hoole
Leete, Miss .....Talbot Hotel
Lewis, Rev. J. S., M.A. .....Newtown Rectory, Mont.
Littler, Miss .....132 Overleigh road, Handbridge
Lloyd, His Honour Sir Horatio ..Stanley place
*LLoyd, Colonel Wilford .....Eccleston Hill, Chester
LLoyd, Mrs. ..... ,, ,,
Lloyd, Miss M. E. .....13 Chichester street
Lloyd, Miss C. .....62 Princess street
Lloyd, Mr. F. Horatio .....11 Stanley place
Lloyd Mrs. ..... ,, ,,
Lockwood, Mrs. .....7 Queen's park
Lockwood, Miss Amy .....90 Foregate street
Lodge, Mr. Geo. T. .....St. Catherine Villa, Lord street
Long, Mrs. .....11 Lumley road
Long, Miss F. ..... ,, ,,
*Longbottom, Mr. F. W. .....Haslemere, Queen's park
Longbottom, Mrs. ..... ,, ,,
Lovell, Mr. A. E., M.A. .....75 Bouverie street
Lovell, Mrs. ..... ,, ,,
Lowe, Miss C. H. .....50 Hough green
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. } 18 Hough green
Lowe, Mrs. ..... ,, ,,
Lowe, Mr. Jas. F., B.A. .....Dee banks
Lowe, Miss E. .....Tarvin Bridge, Tarvin road
Lowry, Mr. E. D. .....Queen's park
Lowry, Mrs. ..... ,, ,,
*Lucas, Mr. A. W., F.G.S. .....Queen's park
Lucas, Miss Ethel ..... ,, ,,
Lumby, Mr. Arthur H. .....17 George street
Lumby, Mr. Ernest Arthur .....15 George street
Lund, Mr. R. S .....24 St. John street
Lutener, Rev. Wm. .....Beech Holme, 8 Curzon park

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Mr. G. E. ..... ,, ,,
*Macdonald, Miss Eva ..... ,, ,,
Maddocks, Mr. Frank .....Riverlea, Dee banks
Manley, Mr. H. .....Aston, Nantwich
Mann, Mr. A., M.B. .....Newgate street
Mann, Mrs. ..... ,, ,,

*Manning, Mr. J. B. .....27 Perryn road, East Acton, London, W.
Manning, Miss Edith .....18 Upper Northgate street
Marriott, Mr. J. W. .....The Grosvenor Museum
Marsden, Miss .....6 Grosvenor park road
Marston, Mr. Chas .....11 Victoria terrace, Mold
Martyn, Mr. G. S. .....24 Newgate street
Mason, Mr. F. B. .....1 Exton park
Mason, Mrs. ..... " "
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
McCulloch, Mr. A. M. .....Lime Grove
McCulloch, Mrs. ..... " "
McCulloch, Mr. H. ..... " "
*McMichael, Mr. J.A., B.A., B.Sc. .39 Parkgate road
McMichael, Mrs. ..... " "
McIneray, Mr. A. J. .....1 Allington terrace, Hoole road
Meacock, Miss .....White Friars Cottage
Meacock, Mr. Chas. .....Bridgegate House, 9 Bridge place
Meacock, Miss ..... " " "
Meeson, Mr. W. H. .....21 Bold square
Middleton, Mr. G. .....1 Sandown terrace
Middleton, Mrs. ..... " "
Mill, Miss F. .....24 Eaton road
Millar, Miss .....5 Hunter street
Miller, Rev. P. A , M.A. .....The Quilletts, 6 Liverpool road
Miller, Mrs. ..... " " "
Miller, Mr. Hugh .....66 Hough green
Miller, Mrs. ..... " "
Millington, Mr. C. .....Victoria House, Victoria road
Millington, Mrs ..... " "
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Read, Miss..... " "
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Walley, Mr. F. .....6 Abbey square
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Ward, Rev. A. W., B.A.....21 Hoole road
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Warren, Mr. Chas. R. .....The Grosvenor Museum
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Wilkinson, Miss ..... " "
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PRESENTED
29 JUL. 1901

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MDCCCCI.

17 OCT. 1902

# Chester Society of Natural Science Literature & Art

Founded by Charles Kingsley 1871

## Thirty-First Annual Report and Proceedings for the Year 1901-1902

For Contents see Title-Page

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# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY, 1871).

## THIRTY-FIRST

# ANNUAL REPORT

AND

# PROCEEDINGS.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art, by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Eight Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any Candidate for Membership of the Society, with those of a Proposer and a Seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

7.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each—except to the Annual General Meeting, to which Members only are admitted.

8.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

9.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

10.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

11.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

12.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

13.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

14.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement, made up to the end of April, and duly audited, shall also be submitted, and read if desired.

15.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

16.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alteration of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

17.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

18.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1902-1903.

## President:

REV. A. H. FISH, B.A., B.Sc.

## Vice-Presidents:

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T. SHEPHEARD, ESQ., F.R.M.S.
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### PHOTOGRAPHIC.

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## Hon. Secretaries:

*Scientific*—DR. STOLTERFOTH, M.A., 1, *Grey Friars*

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MR. W. F. J. SHEPHEARD, F.C.S., *Bridge Street Row*

## Hon. Librarian:

MR. R. NEWSTEAD, A.L.S., F.E.S., *The Grosvenor Museum*

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AND

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REV. J. L. BEDFORD, M.A., F.L.S.
MR. J. DAY
MR. J. LYON DENSON
DR. J. DUFF
DR. GRANGER
DR. HAMILTON
MR. E HODKINSON
DR. KING
DR. J. T. ROBERTS
MR. W. SHONE, F.G.S.
MR. W. W. SIDDALL

## Hon. Auditors:

MR. BERESFORD ADAMS. MR. E. NOEL HUMPHREYS, C.A.

## Curator:

MR. R. NEWSTEAD, A.L.S., F.E.S., *The Grosvenor Museum.*

## Assistant Secretary:

MR. H. NEW.

## Representatives of the Society upon the Grosvenor Museum Management Committee.

REV. A. H. FISH, B.A., B. Sc. | MR. G. P. MILN | MR. J. BAIRSTOW, F.C.S.
MR. J. D. SIDDALL | MR. JOHN SIMON | MR. G. WATMOUGH WEBSTER, F.C.S.

# HON. SCIENTIFIC SECRETARY'S REPORT.

THE Society has, during the past year, shown its usual vitality both in its Excursions and Evening Meetings; the latter have been better attended than I ever remember them to have been. The Lectures have been mainly supplied by our own Members; one of the most remarkable was that given by the Rev. A. H. Fish on the scientific work of Galileo—the pioneer of modern scientific enquiry. There has been good competition for the Kingsley Memorial Prizes, showing that they do hold out an inducement to make collections and careful records of the objects immediately surrounding the observer.

The Society is taking in hand the publication of Mr. Day's work on the *Lepidoptera* of the District. This is now a necessity, in consequence of the many additions that have been made since previous lists were published, to the number of *genera* and *species* found in our locality; we have to thank the electric light in our Chester streets for this. The lamps attract vast numbers of visitors from the country in the shape of winged insects, so that our Members, without going abroad, are furnished with a large field for observation.

Thanks to the Management Committee of the Museum our Curator has a much improved workshop; the old workshop had to be removed to make room for the widening of the street. Through the kindness of the Wilderspool Co., who gave us a small piece of their land which adjoined, and the contributions of many friends, we now have greatly improved work-rooms; and we all know what good use our Curator makes of any facilities that are placed in his way.

Since our last Annual Meeting the RAY SOCIETY has brought out Mr. Newstead's Monograph on the *Coccidæ*, which has met with the universal approval of all Naturalists and is a work to which all practical cultivators of the soil will turn for information and help.

Gladdened by the thought of returning peace, and hoping that our gracious King and Queen may have a bright and happy Coronation, our Members ought to be encouraged to do more than they have ever done in past years.

HENRY STOLTERFOTH,
*Scientific Secretary.*

## HON. SECRETARIES' REPORT.

In accordance with the usual custom, your Committee have pleasure in presenting the Members with a report of the work that has been done during the past year.

It is now thirty-one years since the Society was founded by Charles Kingsley, and your Committee are pleased to report that at the present time it is numerically stronger than at any previous period of its existence.

91 new Members have joined the Society during the past year; and although we have lost by deaths and removals 61, the membership shews there has been a nett gain of 30, making a grand total of 954, as follows:—

| | |
|---|---|
| Honorary Members - - - | 28 |
| Corresponding Members - - | 25 |
| Ordinary Members - - - | 901 |
| Total - - - | 954 |

As will be seen by the Balance Sheet, the finances of the Society are in a satisfactory condition, there being a profit balance in hand of £26 14s. 4d. This is all the more gratifying, as, in addition to the usual expenditure, your Committee have contributed towards the new office and workshop for Mr. Newstead Twenty Guineas, and to the Exhibition of Crafts Five Pounds.

The attendance of Members at the Summer Excursions and Field Meetings, as well as at the General and Sectional Meetings held during the Winter months, has been quite up to if not above the average.

Your Committee have met twelve times during the year for the transaction of the Society's business; but here there is room for improvement on the part of some Members in attending more regularly.

There were fourteen Excursions and Field Meetings held during the Summer months, as follows:—

| | 1901. |
|---|---|
| Plemstall and Mickle Trafford | May 15th |
| St. Mary's Church (within-the-Walls) and The Castle | ,, 22nd |
| "Lache Eye" | ,, 30th |
| Helsby Hill and Quarries | June 5th |
| Glyn Ceiriog (Annual Excursion) | ,, 12th |
| Ball's Knolls, Mollington Meadows | ,, 19th |
| Kinnerton (including the Park & Gardens of Kinnerton Lodge) | ,, 27th |
| Burton Point (Gardens of A. K. Bulley, Esq., Ness), and the Denhall Foreshore | July 4th |
| Saughall and Blacon | ,, 10th |
| Eaton Gardens | ,, 17th |
| The Meadows to Heron Bridge | ,, 31st |
| Messrs. Dicksons' Nurseries at Newton and Upton | September 4th |
| Port Sunlight, near Birkenhead | ,, 18th |
| Saint John's Church and Priory, Chester | ,, 25th |

Note.—An Excursion to Delamere Forest and Meres was arranged to take place on July 24th, but was postponed owing to bad weather.

During the Winter Session there were nine General Meetings and fifteen Sectional Meetings, as follows:—

## GENERAL MEETINGS.

1901.
Oct. 16th—Annual Conversazione.

Nov. 7th—"Tuberculosis"—Dr. H. W. KING.

1902.
Jan. 9th—"Education in connection with Public Health"—
MISS CONST. BARKER.

„ 16th—"Across three Continents on the track of a shadow"—
MISS GERTRUDE BACON (of Newbury).

Feb. 5th—"My Natural History Work"—
MR. R. NEWSTEAD, A.L.S., F.E.S., Hon. F.R.H.S.

„ 27th—"The Microscope"—MR. A. E. GOODMAN.

Mar. 6th—"In a Norwegian Yacht to North Latitude 81° 37'"—
CONRAD GERLAND, M.Sc., (Vict.), Ph. D., F.C.S., &c.

Apr. 3rd—"Galileo Galilei"—REV. A. H. FISH, B.A., B.Sc.

*** The above Lectures were illustrated by Lantern Slides, &c.

„ 16th—Exhibition of Spring Flowers, by
MEMBERS OF THE CHESTER PAXTON SOCIETY AND OTHERS.

## SECTIONAL MEETINGS.

### BOTANICAL.

1901.
Nov. 21st—"Our Local Fungi; How to study them," by
DR. C. THEODORE GREEN, F.L.S. (Birkenhead).

1902.
Mar. 13th—"The Vegetation of the Sea," by
PROF. PHILLIPS (University College, Bangor).

### ZOOLOGICAL.

1902.
Jan. 30th—"Notes and observations on Zoology during the past year," by
DR. W. HENRY DOBIE, MR. J. ARKLE, MR. J. THOMPSON, AND MR. R. NEWSTEAD.

Apr. 17th—"Some Animal Diseases transmissible to man," by
MR. F. G. EDWARDS, M.R.C.V.S.

### GEOLOGICAL.

1902.
Feb. 20th—"How Rocks were formed," by MR. A. W. LUCAS, F.G.S.

### NATURAL PHILOSOPHY.

1901.
Nov. 14th—"Water," by MR. J. KENT SMITH (Technical and Consulting Chemist).

Dec. 5th—"An outline of the theory of Evolution," by MR. H. J. BAX.

1902.
Feb. 13th—"Sleep," by MR. JOHN WELSH, M.R.C.S., L.R.C.P., F.C.S.

## PHOTOGRAPHIC.

1902.
Mar. 27th—Exhibition of the "Amateur Photographer" Prize Lantern Slides for 1901.

Apr. 10th—"Home Portraiture"; Circulating Lecture of the Affiliation of Photographic Societies, by Mr. P. R. SALMON, F.R.P.S.

## LITERATURE.

1901.
Nov. 28th—"Dante Gabriel Rossetti," by REV. P. A. MILLER, M.A.

1902.
Jan. 23rd—"Count Leo Tolstoi," by E. OWEN ROBERTS, ESQ. (Barrister).

## ASTRONOMICAL.

1901.
Dec. 12th—"The Spectroscope and its revelations," by MR. THOMAS THORP.

1902.
Mar. 20th—"The Delineation of Celestial Objects—Drawing *v.* Photography," by DR. WHICHELLO.

NOTE.—Most of the above Sectional Meetings were suitably illustrated by Lantern Slides, &c.

## ART.

1901.
Oct. 16th to Nov. 2nd } A Special Exhibition of Decorative and Applied Art, by Members of the Guild of Arts and Crafts and others.

The Annual Conversazione was very successful in every respect; a gratifying feature being that the whole of the Exhibits were by Members of the Society.

Your Committee wish to acknowledge the help rendered by Members of the Paxton Society in connection with the Conversazione, but more especially in connection with the Exhibition of Spring Flowers, which was this year on a much larger scale than usual.

G. P. MILN, } *Hon. Gen.*
W. F. J. SHEPHEARD, } *Secretaries.*

MAY 8th, 1902.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1902.

| Dr. | £ s. d. | £ s. d. |
|---|---|---|
| 1901. | | |
| By Balance from last Account .. .. | 43 17 3 | 43 17 3 |
| ,, 803 Subscriptions for year 1901-1902 @ 5/- | 200 15 0 | |
| ,, 24 Arrears ,, ,, 1900-1901 @ 5/- | 6 0 0 | |
| ,, 2 ,, ,, ,, 1899-1900 @ 5/- | 0 10 0 | |
| ,, 1 ,, ,, ,, 1898-1899 @ 5/- | 0 5 0 | 207 10 0 |
| ,, Gross Receipts from Excursions— | | |
| To Plemstall Church .. .. .. | 0 5 3 | |
| ,, Helsby Quarries .. .. .. | 0 10 6 | |
| ,, Glyn Ceiriog .. .. .. | 12 19 2 | |
| ,, Kinnerton .. .. .. | 2 5 9 | |
| ,, Burton Point .. .. .. | 1 0 0 | |
| ,, Eaton Hall Gardens .. .. | 2 9 3 | |
| ,, Port Sunlight .. .. .. | 11 9 9 | 30 19 8 |
| ,, Gross Receipts from Evening Meetings— | | |
| Conversazione .. .. .. .. | 14 12 3 | |
| Lecture by Dr. King .. .. .. | 0 3 0 | |
| ,, Miss Gertrude Bacon .. | 0 10 0 | |
| ,, Zoological Section .. | 0 2 0 | |
| ,, Dr. J. Welsh .. .. | 0 2 0 | |
| ,, Mr. Newstead .. .. | 0 3 0 | |
| ,, Mr. Goodman .. .. | 0 5 0 | |
| ,, Dr. Gerland .. .. | 1 4 0 | |
| ,, Dr. Whichello .. .. | 0 2 0 | |
| Exhibition of Spring Flowers .. | 2 0 6 | 19 3 9 |
| | | £301 10 8 |

| Cr. | £ s. d. | £ s. d. |
|---|---|---|
| 1901. | | |
| To Museum Management Committee .. | | 71 5 0 |
| ,, Lantern Account .. .. .. .. | | 11 0 6 |
| ,, Natural History Museum and Library .. | | 26 2 0½ |
| ,, Printing, Stationery, and Advertising .. | | 49 4 1 |
| ,, Postages .. .. .. .. .. | | 25 5 9 |
| ,, Gross Expenses in connection with Excursions — | | |
| Grant to Caretaker, Chester Castle .. | 0 5 0 | |
| Helsby Quarries .. .. .. | 0 5 0 | |
| Glyn Ceiriog .. .. .. .. | 14 9 10 | |
| Kinnerton .. .. .. .. | 1 7 0 | |
| Burton Point .. .. .. .. | 0 13 0 | |
| Eaton Hall Gardens .. .. .. | 1 3 11 | |
| Port Sunlight .. .. .. .. | 8 8 4 | 26 12 1 |
| ,, Expenses in connection with Evening Meetings— | | |
| Conversazione .. .. .. | 13 5 6½ | |
| Lecture by Mr. McMichael—Electric Trams .. .. .. | 0 10 6 | |
| ,, Miss Gertrude Bacon .. | 3 3 0 | |
| ,, Mr. Goodman .. .. | 0 15 0 | |
| ,, Dr. Gerland .. .. | 2 10 6 | |
| ,, Professor Phillips .. | 3 2 6 | |
| ,, Mr. McMichael .. .. | 0 5 6 | |
| Exhibition of Spring Flowers .. | 0 10 4 | 24 2 10½ |
| ,, Salary—Assistant Secretary .. .. .. .. | | 10 0 0 |
| ,, Donation to Arts and Crafts Exhibition .. .. | | 5 0 0 |
| ,, ,, Museum Building Fund .. .. | | 21 0 0 |
| ,, Subscription to Ray Society .. .. .. .. | | 1 1 0 |
| ,, ,, Photographic Society .. .. | | 1 1 0 |
| ,, ,, Entomological Society .. .. | | 1 1 0 |
| ,, ,, Palæontographical Society .. | | 1 1 0 |
| ,, Collecting Subscriptions .. .. .. .. | | 1 0 0 |
| Balance in hand .. .. .. .. | | 26 14 4 |
| | | £301 10 8 |

Examined with the Accounts and Vouchers relating thereto, and found to be correct, shewing a balance of £26 14/4 in the hands of the Hon. Treasurer (in Lloyd's Bank, Limited).

JOHN SIMON, HON. TREASURER.

*Signed* { BERESFORD ADAMS, F. NOEL HUMPHREYS, A.C.A., } HON. AUDITORS.

# "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Account for the Year ended 30th April, 1902. **Cr.**

| 1901-1902. | £ | s | d. |
|---|---|---|---|
| To Balance from last Account | 6 | 13 | 10 |
| ,, Dividends on Great Western Railway Company Consolidated Ordinary Stock | 12 | 0 | 5 |
| ,, Bank Interest..... | 0 | 1 | 2 |
| | £18 | 15 | 5 |
| To Balance in Bank..... | £7 | 19 | 5 |

| 1901-1902. | £ | s. | d. |
|---|---|---|---|
| By Prizes awarded as follows :— | | | |
| Mr. A. E. Goodman..... | 5 | 5 | 0 |
| Miss Payne..... | 1 | 1 | 0 |
| ,, A. Payne ..... | 1 | 1 | 0 |
| ,, Cummings..... | 1 | 1 | 0 |
| ,, G. M. Siddall ..... | 2 | 2 | 0 |
| ,, Engraving Kingsley Memorial Medal, twice.. | 0 | 6 | 0 |
| Balance ..... | 7 | 19 | 5 |
| | £18 | 15 | 5 |

Examined and found correct,

G. P. MILN,
HON. TREASURER.

WILLIAM DODD,
April 25th, 1902.

## KINGSLEY MEMORIAL PRIZES

ARE OFFERED AS FOLLOWS:—

**To any Resident in the Society's District.**—A PRIZE not exceeding TEN POUNDS for the best COLLECTION OF OBJECTS, OR ESSAYS, OR NOTES OF OBSERVATIONS, OR PHOTOGRAPHS illustrating the Natural Science of the Society's District. The amount given will be proportionate to the *quality* of the Collection.

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the persons competing.

*The Collections, Essays, or Notes, must be sent in to either of the General Secretaries on or before 1st September, and the awards will be made at the Conversazione next succeeding the adjudication.*

**NOTE.—The Committee have the option of retaining the successful Collections, &c., or any part of them, for the Society.**

Intending Competitors can obtain all particulars, and the conditions under which the Prizes are offered, from either of the General Secretaries; and all Collections, &c., must be sent in to either of them on or before the 1st September in each year.

# CURATOR'S REPORT.

SOME of the most noteworthy additions to the Society's Museum during the past year are as follows :—

(1) Great Snipe (*Gallinago major*, J. F. GMELIN), presented by DR. T. MORETON, of Tarvin. The specimen is somewhat abnormal in certain specific details, but MR. HOWARD SAUNDERS, who has seen the specimen, says there can be no doubt as to its identity. This rare species is new to our Collection.

(2) A beautiful pair of Waxwings (*Ampelus garrulus*, LINN.) The female was obtained near Whitchurch, on December 24th, 1901, and presented by MR. THOS. BATEMAN, who for many years has shown much interest in obtaining specimens for this Museum. The male, which is in most perfect condition, was presented by MR. WARBURTON, of Astbury.

(3) Eggs of the Common Teal (*Nettion crecca*, LINN.), by MR. ATHELSTON DAY.

MR. WALTER HARRISON, of the New Pale, Manley, has also made some interesting additions to the Life-History Groups of Birds, and your Curator here begs to acknowledge the great help and courtesy he has frequently extended to him.

While our additions are this year very much below the average, there has been an increased interest shown by our working members, representing the various branches both of Botany and Zoology. It is to such workers that we must look to for help in the making of our collections; and your Curator begs, on behalf of his Committee, to tender sincere thanks to all those who have so generously handed over many of their rarest captures, in order that our collections of the *Flora* and *Fauna* may be as nearly as possible complete. Your Curator would specially mention MISSES STEELE PERKINS (Rhyl), MR. J. ARKLE, MR. BURGESS SOPP, MR. R. J. SMITH, MR. T. A. COWARD, MR. CHAS. OLDHAM, and MR. GEO. O. DAY. Your Curator begs also to tender sincere thanks to DR. STOLTERFOTH, MR. W. F. J. SHEPHEARD, and the REV. A. H. FISH, for the use of Photographic and Collecting Apparatus and materials.

MR. BROCKTON TOMLIN has kindly undertaken to overhaul the Archer Collection of Shells, and has already gone through that portion containing the species dredged in the Liverpool Bay, which he has cleaned and remounted.

Owing to the pulling down of the Curator's old workshop, at the beginning of the financial year, it has been almost impossible to make any important preparations for the Museum; but as the new offices are nearing completion, your Curator hopes very shortly to be able to return to this department of his work. The new premises consist of one ground and one first-floor rooms, which are adequately fitted and lighted to suit the nature of the work to be carried on in them.

The following is a list of the Donors :—

MR. J. ARKLE—30 Species of *Lepidoptera*; 2 *Coleoptera*; 2 *Neuroptera*; 1 *Hymenoptera*.

MR. THOS. BATEMAN—3 species of Birds, including an example of the Waxwing (*Ampelus garrulus*, LINN.), from near Whitchurch; 1 Viper (*Pelius berus*), with disgorged Field Vole; 1 Hooded Crow (*Corvus cornix*, LINN.)

MR. J. BAIRSTOW—1 Bearded Rockling (*Motella vulgaris*, CUV.)

MR. T. A. COWARD—1 Common Lizard.

MR. H. CRANE—1 Swift (*Cypselus apus*).

Collected by THE CURATOR—157 species of various orders of Insects; 184 species of various other orders.

MR. ATHELSTON DAY—6 Eggs of the Common Teal; Clutch of Skylark with Cuckoo.

MR. S. J. R. DICKSON—Embryo Nest of Wasp (*Vespa germanica*).

MR. H. B. DUTTON—1 specimen of an Exotic Hymenopterous Insect, from freshly imported fruit.

MR. GUY—Large Minnow.

MR. WALTER HARRISON—Life History of the Jay (*Garrulus glandarius*); The Tree-Creeper (*Certhia familiaris*); Weasel and Mouse, caught together in an ordinary "gin" trap, in a stable.

MR. J. JONES—1 Cygnet, in down.

MR. A. E. LOVELL—66 species of Plants.

DR. T. MORETON—1 Great Snipe (*Gallinago major*).

MESSRS. CHAS. OLDHAM and T. A. COWARD—2 Eggs of the Manx Shearwater; 3 species of *Coleoptera*; 2 species of *Lepidoptera*.

MISS STEELE PERKINS—8 species of *Lepidoptera*; 1 species of *Coleoptera*.

MR. JOSEPH PICKERING—Several specimens of a Parasite from the Perch.

MR. F. E. ROOPER—1 slab of Graptolites; 1 specimen of *Orthocerus* (both from the Wenlock Shale).

MR. THOS. SHEPHEARD, F.R.M.S.—Portrait of Prof. Wallace, in frame.

MR. GEORGE SHRUBSOLE—61 Microscopical preparations of various Geological specimens; 154 tubes and boxes of Shells from Boulder Clay; 116 specimens of *Fenestellidæ*, &c., from Mountain Limestone.

MR. R. J. SMITH—5 species of Birds; 10 species of *Lepidoptera*.

MR. E. BURGESS SOPP—2 specimens of *Chrysomela cerealis*; 2 *Ægialia rufa*.

MR. BROCKTON TOMLIN—1 *Fusus islandicus*.

KINGSLEY MEMORIAL PRIZE COLLECTIONS:—

MR. A. E. GOODMAN—19 plates of Micro-Photographs, illustrative of various Natural History objects, together with explanations and instructions on Micro-Photography.

MISS PAYNE, MISS A. PAYNE, and MISS CUMMINGS—Collection of the *Graminæ* of the District.

PURCHASED—2 specimens of Convolvulus Hawk Moths (*Sphinx convolvuli*); 1 specimen *Acherontia atropos*; 1 Bittern (*Botaurus stellaris*, LIN.)

R. NEWSTEAD, A.L.S., F.E.S., HON. F.R.H.S.,
CURATOR.

APRIL 31ST, 1902.

# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1901,

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

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The results here given are deduced from bi-daily observations of the standard instruments, taken at 9·0 a.m. and 9·0 p.m. local mean time. Returns are sent to the Royal Meteorological Society, the Meteorological Council, the Scottish Meteorological Society, and many private observers in different parts of the Empire.

January.—Normal in regard to mean temperature range, rainfall, and pressure. Very severe gales during the last week from the W.N.W., accompanied with hail, snow, thunder, and lightning; a remarkable series of three thunderstorms on the 27th, 28th, and 29th. The last ten days being very unsettled with stormy, wet, and windy weather from the W.

February.—High pressure; mean temperature almost 3° below the average; a still snowy, keen, wintry month. Candlemas day dismal, dark, dripping. The weather adage proved a dismal failure this year. The coldest, dullest, and most dismal weather coming in February instead of January is not unfrequent, and invariably produces a long winter and a backward spring. This year is a typical example of these conditions.

March.—Pressure low; mean temperature 2·5° below the average, giving the weather conditions that belong to an average February, prolonging the winter and retarding the spring. The month was characterized by heavy falls of rain on the first nine days, and snow during the last nine; and as the wind was from the East for the last half of the month, it gave the cold a keener edge, and brought dismal overcast days; extremely gloomy.

April.—Pressure low; mean temperature one degree above the average. A warm, bright, quiet, and pleasant month. Heavy rain on five or six days; more than the usual bright sunshine. Frequent frosts on the ground. No gales. High-day temperature from 19th to 25th, and no rain. Prevailing wind southerly.

May.—Pressure high; a superb month, mean temperature fully 2·0° above the average, and, along with the pleasant April, doing much to redeem the backward spring. A gale on the 31st. Thunder heard and heavy rain fell on 29th. Rainfall deficient, but bright sunshine abundant. Altogether, a most pleasant and delightful spring month.

June.—A disappointing month, not at all fulfilling the promise of April and May. Mean temperature fell to 1·6° below the average. Maximum temperature only rose above 70° on eight days, and fell below 60° on three days. Rainfall deficient. Prevailing winds easterly. Solar radiation very intense on 25th and 26th.

July.—Pressure high; mean temperature 3·7° above the average. Shade temperature rose above 80° on nine days. Over an inch of rain fell on the 25th, and during the six days, 23rd to 28th, 3·735 inches fell; the rest of the month was very dry. Sunshine normal. Many overcast days. Thundry period coincident with the rainy days.

August.—Pressure high; temperature normal. The maximum in shade did not rise to 80° nor fall to 60°. About an inch and a quarter of rain fell on the 26th, when two thunderstorms broke over the City. There was another thunderstorm on the 11th, with only slight rainfall. A severe gale from the W.N.W. accompanied the thunderstorm of the 26th. Very heavy dews fell on the third week.

SEPTEMBER.—Pressure low; mean average temperature fully one degree above the average. Very deficient in the amount of rainfall by fully one-and-three-quarter inches. Shade temperature only touched 71° on two days, and fell to 59·5° on one. Westerly gale on 17th, and strong breeze from South on 20th. Heavy dews.

OCTOBER.—A wet, stormy, bleak month; pressure high. Rainfall a quarter-of-an-inch above the average. Westerly gales on the 6th, 7th, and 9th. A considerable deficiency of bright sunshine, and half of the month with overcast skies. Frost on the ground on five nights, and prevailing wind from the S.W. The mean temperature about one degree above the average.

NOVEMBER.– High pressure; low mean temperature about 3° below the average. Very dull; 20 days being quite overcast. Nearly half-an-inch more than the average rainfall due to an inch-and-a-half fall on the 11th, accompanied by an extremely low pressure; otherwise, the month was rather dry containing fewer than the usual number of rainy days. Frost on the ground on 16 nights; 13 days without any bright sunshine.

DECEMBER.—Another dull month; 10 days without any bright sunshine, and 15 entirely overcast. Fully two inches more than the average rainfall on 20 rainy days. Prevailing wind N.W. Strong breeze on the 6th and 14th. Heavy hailstorm on 8th and 9th, with lightning and high wind from N.W. An unusually cold, bleak, and wet month.

As the tables give the Meteorological elements for the year 1901 only, it is desirable to add a comparison of the winter and spring months of the present year in brief.

## SHADE TEMPERATURE, AND DIFFERENCE FROM AVERAGE.

| **Winter of 1901-2.** | | **Spring of 1902.** | |
|---|---|---|---|
| December .. .. | 39·2°+0·5° | March .. .. | 45·4°+3·2° |
| January .. .. | 41·9°+4·4° | April .. .. | 45·8°—0·8° |
| February .. .. | 34·7°—5·3° | May .. .. | 48·9°—3·5° |
| Mean .. .. | 38·3°—0·4° | Mean .. .. | 46·7°—0·4° |

THE WINTER MONTHS.—*December* a little *above* the average temperature; *January* 4½ almost *above* it; and *February* fully 5¼ degrees *below* it. The abnormally warm January, followed by an unusually cold February, made the sudden transition to severe winter weather throughout the whole of February most trying, and threw back the spring considerably.

THE SPRING MONTHS —*March* 3½ degrees above the average modified the severity of the spring. *April* nearly 1 degree colder than the average; and *May*—a most severe month—3⅓ degrees below the average temperature, with bitter cold winds, made a hopelessly backward spring, and seemed to prolong the winter to the very verge of summer.

## NOTEWORTHY PHENOMENA OF 1901.

| | |
|---|---|
| Greatest atmospheric pressure ..... | 30·657 in., 15th February |
| Least " " ..... | 28·725 in., 24th December |
| Hottest day in shade ..... | 88·9 degs., 18th July |
| Coldest night in shade ..... | 20·6 degs., 14th February |
| Greatest range of temperature in 24 hours .. | 34·3 degs., 24th May |
| Least " " " .. | 2·3 deg., 18th February |
| Hottest day in sun ..... | 137·5 degs., 17th July |
| Coldest night on ground ..... | 14·6 degs., 9th February |

Greatest excess of open air temperature over shade temperature, 65·2 degs., 25th June.

Greatest difference between lowest temperature in shade and on ground, 22·4 degs., 9th June.

Greatest rainfall on any one day, 1·480 in., 11th November.

Latest early Summer frost, 0·6 degs., 12th May.

Earliest Autumn frost, 0·2 degs., 10th October.

Severe gales, 27th January, 26th August, and 6th and 9th October.

A series of thunderstorms on 27th, 28th, and 29th January; 21st, 26th, 27th, and 28th July; also on 10th and 26th August, and 1st October.

Greatest number of consecutive days on which rain fell, 9, 1—9th March, and 20th—28th July.

Greatest number of consecutive days on which no rain fell, 15; 11th to 25th May.

Sunniest day of the year, 13·75 hours, on 24th May, being 87 per cent. of the greatest possible amount.

More bright sunshine in the afternoons, averaging fully half-an-hour on each day of bright sunshine.

Welsh Hills at 9 a.m.—These were only visible on 85 days, a little less than one-fourth of the year; 54 days clearly and 31 very clearly seen.

## EXPLANATIONS.

*Local Mean Time* is used for the regular observations.

*The Barometer* readings, taken at 9·0 a.m. and 9·0 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9·0 a.m., and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9·0 a.m. and placed to previous day.

*Ground Temperatures* read twice daily at 9·0 a.m. and 9·0 p.m. The lowest reading for the 24 hours. prior to 9·0 a.m., is entered to the previous day.

*Underground Temperatures* taken daily at 9·0 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew Point (as determined by Glaisher's Factors), by that corresponding to the temperature of the air (*i.e.* the Dry-bulb reading).

*The Rain* is measured at 9·0 a.m., and the amount entered to the previous day. A fall of 0·006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9·0 a.m. and 9·0 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8·0 an overcast day.

The *wind* direction is taken by means of a Compass Nephoscope, from the drift of the lower clouds.

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Ozone* read at 9·0 a.m. (according to Dr. Moffat's Scale 0—12), and placed to previous day.

*Sunshine Record.*—The photographic traces are fixed *before* being measured.

*Fog, &c.*—The fog, haze, &c., are made from the visibility of objects and lights at definite distances from Rutland Cottage.

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | Bright Sunshine. Hours ending Local Apparent Time of each Day of the Month. Forenoon. 6 | 7 | 8 | 9 | 10 | 11 | Noon | Afternoon. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Monthly. Total Hours. | Greatest Possible Percentage. | No. of days without. | Seasons. Hours and Percentage. | Cloud (1—10). 9 a.m. | 9 p.m. | Daily Mean. | No. of days Overcast. | No. of days Clear. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. ... | | | | ·58 | 2·50 | 7·25 | 9·33 | 10·41 | 10·50 | 6·40 | | | | | | | 46·97 | 19·1 | 13 | Winter 148·12 19·9% | 8·5 | 6·0 | 7·3 | 14 | 1 |
| Feb. ... | | | | 2·98 | 6·92 | 9·83 | 11·08 | 11·62 | 7·83 | 6·83 | 3·34 | ·25 | | | | | 60·68 | 22·5 | 13 | | 7·1 | 7·0 | 7·0 | 14 | 1 |
| March.. | | | ·33 | 6·83 | 8·00 | 10·16 | 13·90 | 13·42 | 13·15 | 15·12 | 14·86 | 13·66 | 7·47 | 2·25 | | | 119·15 | 32·7 | 6 | Spring 589·98 46·6% | 8·8 | 7·3 | 8·1 | 19 | 1 |
| April... | | ·25 | 10·51 | 17·41 | 20·41 | 19·82 | 20·09 | 21·08 | 18·46 | 17·83 | 18·81 | 18·15 | 13·74 | 3·16 | | | 199·72 | 48·1 | 1 | | 6·7 | 4·9 | 5·8 | 6 | 2 |
| May ... | 1·92 | 2·33 | 21·50 | 23·82 | 22·99 | 23·91 | 23·42 | 23·74 | 23·41 | 21·25 | 21·99 | 19·16 | 17·84 | 12·83 | 1·00 | | 271·11 | 55·8 | 2 | | 5·0 | 4·4 | 4·7 | 6 | 10 |
| June ... | 6·58 | 15·74 | 17·19 | 15·76 | 14·25 | 15·16 | 16·85 | 18·48 | 17·46 | 17·66 | 15·34 | 13·92 | 11·99 | 10·65 | 5·92 | ·25 | 213·20 | 42·7 | 3 | Summer 649·36 44·1% | 6·2 | — | — | 10 | 3 |
| July ... | 5·08 | 15·24 | 17·74 | 15·50 | 18·42 | 18·92 | 20·32 | 21·16 | 20·82 | 19·40 | 19·49 | 16·26 | 15·08 | 10·75 | 2·16 | | 236·34 | 47·3 | 3 | | 7·1 | 6·6 | 6·8 | 10 | 2 |
| Aug. ... | | ·26 | 17·84 | 18·99 | 19·09 | 15·75 | 16·57 | 17·57 | 20·25 | 17·59 | 16·84 | 17·58 | 13·50 | 7·99 | | | 199·82 | 44·4 | 4 | | 7·0 | 5·2 | 6·1 | 10 | 4 |
| Sept.... | | | 8·75 | 12·49 | 13·33 | 17·80 | 16·01 | 15·67 | 15·83 | 13·66 | 12·50 | 10·35 | 6·24 | ·09 | | | 142·72 | 38·2 | 1 | Autumn 289·24 30·5% | 7·4 | 6·2 | 6·8 | 11 | — |
| Oct. ... | | | 1·75 | 6·25 | 9·74 | 11·75 | 12·16 | 13·08 | 11·16 | 10·41 | 11·16 | 4·25 | | | | | 91·71 | 28·5 | 5 | | 8·0 | 7·4 | 7·7 | 16 | 1 |
| Nov. ... | | | | ·75 | 4·33 | 7·00 | 9·92 | 11·42 | 11·48 | 8·75 | 1·16 | | | | | | 54·81 | 21·6 | 13 | | 8·1 | 7·2 | 7·7 | 20 | 4 |
| Dec. ... | | | | | ·58 | 4·58 | 10·42 | 12·24 | 9·16 | 3·49 | | | | | | | 40·47 | 17·7 | 10 | | 8·0 | 6·0 | 7·0 | 15 | 1 |
| | 13·58 | 43·82 | 95·61 | 121·36 | 140·36 | 161·93 | 180·07 | 189·89 | 179·51 | 158·39 | 135·49 | 113·58 | 85·86 | 47·72 | 9·08 | ·25 | 1676·70 | 38 % | 74 | | 7·3 | 6·2 | 6·8 | 151 | 30 |

During Forenoon 756·93. During Afternoon 919·77.

# METEOROLOGICAL OBSERVATIONS

## RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N.; Long. 11m. 36s. W.

| | MONTHLY SUMMARY O | | | |
|---|---|---|---|---|
| | JAN. | FEB. | MARCH. | APRIL |
| PRESSURE (reduced to 32° F., and mean sea level)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 29·996in. | 30·081in. | 29·781in. | 29·80 |
| Highest reading | 30·621in. | 30·657in. | 30·548in. | 30·26 |
| ,, ,, Date of | 23 | 15 | 23 | 17 |
| Lowest ,, | 29·332in. | 29·253in. | 28·929in. | 29·3 |
| ,, ,, Date of | 27 | 27 | 2 | 8 |
| Range | 1·289in. | 1·404in. | 1·619in. | ·91 |
| TEMPERATURE in shade (Stevenson's screen)— | | | | |
| Approximate mean | 39·3° | 37·0° | 40·2° | 48·1 |
| Arithmetical mean | 39·1° | 37·0° | 40·3° | 48·2 |
| Climatological ,, | 38·6° | 34·9° | 40·3° | 48·3 |
| Dry bulb (9 a.m. and p.m.) mean | 39·4° | 36·1° | 39·7° | 48·0 |
| Mean maximum | 43·9° | 41·9° | 46·0° | 57·0 |
| Mean minimum | 34·4° | 32·2° | 34·7° | 39·4 |
| Extreme maximum | 54·4° | 50·0° | 57·0° | 73· |
| ,, ,, Date of | 22 | 27 | 12 | 2 |
| ,, minimum | 21·6° | 20·6° | 23·5° | 32· |
| ,, ,, Date of | 9 | 14 | 29 | 1 |
| ,, range | 32·8° | 29·4° | 33·5° | 40· |
| Mean daily range | 9·4° | 9·7° | 11·3° | 18· |
| Maximum daily range | 17·3° | 20·0° | 20·0° | 28· |
| ,, ,, Date of | 22 | 20 | 22 | 2 |
| Minimum ,, | 4·0° | 2·3° | 2·8° | 9 |
| ,, ,, Date of | 7 | 18 | 24 | |
| Number of nights at or below 32° | 10 | 14 | 10 | |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 56·5° | 63·3° | 89·1° | 97· |
| Extreme maximum | 79·6° | 87·0° | 100·0° | 113 |
| ,, ,, Date of | 30 | 27 | 31 | 3 |
| Greatest excess over shade maximum | 39·1° | 39·6° | 54·4° | 47· |
| ,, ,, ,, ,, Date of | 30 | 14 | 28 | |
| Average ,, ,, ,, | 12·6° | 21·4° | 34·0° | 3 |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 30·1° | 27·7° | 30·4° | 3 |
| Extreme minimum | 14·6° | 15·0° | 19·6° | 2 |
| ,, ,, Date of | 9 | 7 | 26 | |
| Greatest difference from shade minimum | 8·3° | 11·9° | 16·8° | 1 |
| ,, ,, ,, ,, Date of | 2 | 7 | 1 | |
| Mean ,, ,, ,, | 4·3° | 4·5° | 4·3° | |
| Number of nights at or below 32° | 19 | 19 | 16 | |
| TEMPERATURE underground— | | | | |
| Mean at 1 foot | 39·4° | 37·5° | 40·8° | 4 |
| Range ,, | 6·5° | 6·2° | 5·3° | 1 |
| Mean at 2 feet | 41·4° | 38·7° | 41·8° | 4 |
| Range ,, | 4·1° | 3·2° | 2·3° | |
| Mean at 3 feet | 43·4° | 40·8° | 42·6° | 4 |
| Range ,, | 3·7° | 2·4° | 1·8° | |
| Mean at 4 feet | 44·3° | 41·9° | 42·8° | 4 |
| Range ,, | 3·1° | 2·2° | 1·5° | |
| Air temperature, 9 a.m. | 39·7° | 36·2° | 40·1° | 4 |
| Range of ,, ,, | 21·0° | 21·5° | 20·0° | |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 2·030 | 1·405 | 1·760 | |
| ,, ,, since 1st January | | 3·435 | 5·195 | |
| Maximum fall in 24 hours | ·610 | ·510 | ·270 | |
| ,, Date of | 19 | 4 | 2 | |
| Number of days 0·01 fell | 17 | 16 | 17 | |
| ,, ,, since 1st January | | 33 | 50 | |
| Mean relative humidity, 9 a.m. | 78 | 90 | 85 | |
| ,, ,, 9 p.m. | 88 | 92 | 83 | |
| ,, ,, of both | 83 | 91 | 84 | |
| Mean vapour pressure, 9 a.m. | ·192 | ·193 | ·208 | |
| ,, ,, 9 p.m. | ·206 | ·194 | ·198 | |
| ,, ,, of both | ·199 | ·193 | ·203 | |
| Mean dew point, 9 a.m. | 33·5° | 33·5° | 33·4° | |
| ,, ,, 9 p.m. | 33·2° | 33·6° | 34·2° | |
| ,, ,, of both | 33·35° | 33·55° | 33·8° | |

OSPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| | JUNE. | JULY. | AUGUST. | SEPT. | OCT. | NOV. | DEC. | YEARLY SUMMARY. |
|---|---|---|---|---|---|---|---|---|
| 24in. | | 30·009in | 30·018in. | 29·893in. | 29·889in. | 30·451in. | 29·585in. | |
| 5in. | | 30·293in | 30·489in. | 30·255in. | 30·437in. | 30·645in | 30·387in. | 30·657in. |
| | | 7 | 20 | 26 | 31 | 25 | 4 | 15 Feb. |
| 5in. | | 29·592in. | 29·361in. | 29·244in. | 29·097in. | 28·898in. | 28·725in | 28·725in. |
| | | 24 | 26 | 20 | 18 | 12 | 24 | 24 Dec. |
| 0in. | | ·701in | 1·128in. | 1·011in. | 1·340in | 1·747in. | 1·662in. | 1·932in. |
| ° | 57·1° | 64·6° | 60·7° | 57·4° | 50·1° | 41·5° | 39·1° | 49·1° |
| ° | 57·7° | 65·2° | 61·2° | 57·7° | 50·3° | 41·5° | 38·9° | 49·3° |
| ° | 57·7° | 65·2° | 61·4° | 57·7° | 50·7° | 41·8° | 39·3° | 49·2° |
| ° | 57·7° | 64·3° | 60·9° | 57·7° | 49·7° | 41·4° | 39·2° | 49·0° |
| ° | 66·8° | 74·5° | 69·0° | 65·8° | 57·7° | 47·4° | 43·6° | 50·6° |
| ° | 48·7° | 56·0° | 53·3° | 49·7° | 42·9° | 35·5° | 34·2° | 42·0° |
| ° | 79·1° | 88·9° | 79·2° | 71·0° | 67·6° | 58·9° | 55·9° | 88·9° |
| | 28 | 18 | 25 | 9 & 28 | 8 | 10 | 8 | 18 July |
| ° | 42·1° | 48·3° | 45·1° | 42·0° | 33·9° | 22·2° | 20·7° | 20·6° |
| 12 | 13 | 16 | 20 | 15 | 26 | 16 | 22 | 14 Feb. |
| ° | 28·0° | 40·6° | 34·1° | 29·0° | 33·7° | 36·7° | 35·2° | 68·3° |
| ° | 18·1° | 18·5° | 15·7° | 16·1° | 14·8° | 11·9° | 9·4° | 14·6° |
| ° | 28·8° | 32·5° | 28·3° | 23·6° | 25·1° | 23·2° | 19·7° | 34·3° |
| | 28 | 20 | 22 | 1 | 8 | 1 | 30 | 24 May |
| ° | 9·6° | 5·1° | 5·4° | 9·4° | 6·7° | 2·5° | 2·9° | 2·3° |
| | 21 | 24 | 14 | 19 | 7 | 8 | 13 | 18 Feb. |
| | 0 | 0 | 0 | 0 | 0 | 12 | 14 | 60 |
| 6 | 113·2° | 110·4° | 105·7° | 96·7° | 83·2° | 64·4° | 52·1° | 86·3° |
| ° | 132·6° | 137·5° | 119·5° | 110·8° | 99·2° | 83·7° | 69·0° | 137·5° |
| | 26 | 17 | 25 | 8 | 9 | 10 | 2 | 17 July |
| ° | 65·2° | 54·1° | 52·8° | 41·2° | 40·2° | 31·6° | 24·8° | 65·2° |
| | 25 | 17 | 29 | 8 | 9 | 17 | 9 | 25 Jan. |
| 8° | 46·4° | 35·9° | 36·7° | 30·9° | 25·5° | 17·0° | 8·5° | 28·9° |
| 6° | 45·3° | 53·3° | 49·8° | 44·9° | 37·5° | 30·7° | 28·9° | 37·4° |
| 1° | 37·7° | 43·3° | 43·5° | 36·5° | 28·8° | 18·7° | 19·6° | 14·6° |
| | 18 | 16 | 20 | 5 | 26 | 17 | 23 | 9 Jan. |
| 7° | 22·4° | 12·5° | 9·9° | 12·5° | 10·6° | 9·4° | 10·1° | 22·4° |
| | 9 | 11 | 8 | 14 | 25 | 10 | 5 | 9 June |
| 7° | 3·4 | 2·7° | 3·5° | 4·8° | 5·4° | 5·5° | 5·3° | 4·6° |
| | 0 | 0 | 0 | 0 | 5 | 16 | 23 | 111 |
| 3° | 57·8° | 64·0° | 62·0° | 57·7° | 52·2° | 44·3° | 40·4° | 49·8° |
| 3° | 6·4° | 9·8° | 7·3° | 3·2° | 9·9° | 7·4° | 10·2° | 7·7° |
| 2° | 56·5° | 62·2° | 61·3° | 57·7° | 53·2° | 46·3° | 42·0° | 50·0° |
| 5° | 3·9° | 7·2° | 5·1° | 2·4° | 7·6° | 6·3° | 6·8° | 5·3° |
| 1° | 55·5° | 60·4° | 60·9° | 58·0° | 54·6° | 48·6° | 44·3° | 50·5° |
| 5° | 1·8° | 5·6° | 2·3° | 2·4° | 5·8° | 6·0° | 5·8° | 4·2° |
| 3° | 53·6° | 58·1° | 59·6° | 57·5° | 54·7° | 49·4° | 45·4° | 50·2° |
| 4° | 2·6° | 5·2° | 1·2° | 1·9° | 4·9° | 5·0° | 4·4° | 3·5° |
| 6° | 59·3° | 66·8° | 63·5° | 59·4° | 50·8° | 41·6° | 39·9° | 50·3° |
| 5° | 21·4° | 20·5° | 20·8° | 13·3° | 24·3° | 28·8° | 27·0° | 21·4° |
| 135 | 2·015 | 3·955 | 3·195 | ·745 | 2·820 | 2·905 | 4·275 | 28·340 |
| 830 | 10·445 | 14·401 | 17·595 | 18·340 | 21·140 | 24·045 | 28·340 | |
| 55 | ·420 | 1·080 | 1·170 | ·145 | ·725 | 1·480 | ·790 | 1·480 |
| | 30 | 25 | 26 | 16 | 6 | 11 | 12 | 11 Nov. |
| 1 | 15 | 13 | 15 | 13 | 18 | 13 | 20 | 182 |
| | 90 | 103 | 118 | 131 | 149 | 162 | 182 | 20 Dec. |
| 7 | 72 | 78 | 72 | 75 | 87 | 89 | 89 | 80 |
| 7 | 85 | 87 | 85 | 84 | 90 | 91 | 91 | 87 |
| 7 | 78 | 82 | 78 | 80 | 88 | 90 | 90 | 84 |
| 83 | ·364 | ·509 | ·423 | ·331 | ·321 | ·231 | ·216 | ·303 |
| 97 | ·417 | ·477 | ·417 | ·377 | ·307 | ·230 | ·211 | ·299 |
| 5 | ·420 | ·493 | ·420 | ·379 | ·314 | ·231 | ·214 | ·301 |
| 2° | 50·3° | 50·9° | 54·3° | 51·5° | 46·7° | 38·2° | 36·7° | 43·2° |
| 5° | 48·0° | 57·6° | 53·9° | 51·1° | 45·7° | 38·1° | 36·0° | 43·1° |
| 6·° | 49·1° | 54·3° | 54·1° | 51·3° | 46·2° | 38·2° | 36·3° | 43·2° |

## WIND AND OZONE.

| | Force. | | | | | Direction to 8 Points of the Compass. | | | | | | | | | Ozone. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 9 p.m. | Mean. | Maximum. | Date of | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. | Mean Amount. | Maximum. |
| January ... | 1·9 | 2·4 | 2·2 | 9 | 27 | SE | 1 | 1 | 4 | 18 | 6 | 7 | 10 | 8 | 7 | 1·4 | 6 |
| February | 0·7 | 0·5 | 0·6 | 4 | 23 | NW | 3 | 3 | 2 | 3 | 1 | 5 | — | 13 | 26 | 2·4 | 7 |
| March ... | 1·7 | 1·4 | 1·5 | 6 | 5 | W | 4 | 10 | 8 | 3 | 1 | 5 | 11 | 6 | 14 | 1·5 | 7 |
| April ... | 2·2 | 1·3 | 1·8 | 5 | 8 & 15 | S | 4 | 4 | — | 10 | 11 | 7 | 5 | 9 | 10 | 3·5 | 7 |
| May ... | 1·6 | 0·6 | 1·1 | 4 | 31 | SE | 4 | 4 | 1 | 13 | 3 | 7 | 2 | 8 | 20 | 1·7 | 7 |
| June ... | 2·2 | | | 5 | 11, 13, & 7 | NW | 6 | 4 | 2 | 12 | 6 | 8 | 4 | 12 | 6 | 4·1 | 8 |
| July ... | 1·3 | 0·1 | 0·7 | 5 | 22 | W | 4 | 5 | 6 | 1 | 4 | 3 | 7 | 7 | 25 | 2·0 | 7 |
| August ... | 3·0 | 1·5 | 2·2 | 9 | 26 | W | 2 | 1 | 1 | 1 | 6 | 8 | 15 | 16 | 12 | 3·4 | 6 |
| September | 2·4 | 1·5 | 2·0 | 7 | 17 | S | — | 1 | 5 | 6 | 14 | 8 | 9 | — | 17 | 2·0 | 7 |
| October ... | 2·6 | 1·7 | 2·2 | 8 | 6 & 9 | SW | 2 | 1 | 3 | 7 | 8 | 11 | 8 | 7 | 15 | 1·3 | 7 |
| November | 1·6 | 1·5 | 1·5 | 5 | 12& 27 | W | 5 | 4 | — | 10 | 2 | 3 | 10 | 9 | 17 | 2·0 | 7 |
| December | 2·6 | 2·4 | 2·5 | 8 | 30 | NW | 4 | 3 | 2 | 7 | 3 | 5 | 12 | 20 | 6 | 2·9 | 8 |
| Totals ... | 2·0 | 1·4 | 1·7 | 9 | Jan 27 Aug. 26 | W | 39 | 41 | 34 | 91 | 65 | 77 | 93 | 115 | 175 | 3·4 | 8 |
| Percentages | | | | | | | 6·5 | 5·2 | 4·5 | 12·3 | 8·9 | 10·4 | 12·5 | 15·7 | 24·0 | | |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | At 9 a.m. or 9 p.m. or both. | | | | | At any Hour. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dew. | Hoar Frost. | Welsh Hills, 9 a.m. Visible. | | | Thunder Storm. | Lightning only. | Thunder only. | Halo. | Gales. | Aurora. | Snow | Hail. | Fog. |
| | | | Invisible | Clearly | Very clearly | | | | | | | | | |
| January ... | 8 | 6 | 28 | 3 | — | 3 | 1 | — | 2 | 4 | — | 2 | 3 | 8 |
| February ... | 3 | 11 | 25 | 2 | 1 | — | — | — | — | — | — | 4 | — | 2 |
| March... ... | 4 | 3 | 27 | 3 | 1 | — | — | — | 1 | — | — | 4 | — | 1 |
| April ... ... | 9 | — | 21 | 5 | 4 | — | — | — | 1 | — | — | — | 1 | — |
| May ... ... | 5 | — | 28 | 2 | 1 | — | — | 1 | 1 | 1 | — | — | — | — |
| June ... ... | 3 | — | 21 | 7 | 2 | — | — | — | — | — | — | — | — | — |
| July ... ... | 3 | — | 26 | 1 | 4 | 3 | — | 1 | — | — | — | — | — | — |
| August ... | 12 | — | 13 | 9 | 9 | 3 | — | — | — | 1 | — | — | — | — |
| September ... | 17 | — | 23 | 6 | 1 | — | — | — | — | 1 | — | — | — | — |
| October ... | 12 | — | 25 | 3 | 3 | 1 | 1 | 1 | 2 | 3 | — | — | 1 | 5 |
| November ... | 3 | 8 | 24 | 2 | 4 | — | — | — | 2 | — | — | 1 | — | 7 |
| December ... | 1 | 10 | 19 | 11 | 1 | — | — | 2 | 3 | 2 | — | 3 | 4 | — |
| Total ... | 80 | 38 | 280 | 54 | 31 | 10 | 2 | 5 | 12 | 12 | — | 14 | 9 | 23 |

## BOTANICAL SECTION.

The Section has met twice during the past Session.

DR. C. THEODORE GREEN, F.L.S., of Birkenhead, gave an interesting Lecture on Thursday, November 21st, 1901, on "Our Local Fungi; how to study them." The Lecture was illustrated by about 100 Coloured Drawings, made from actual specimens which the Doctor had collected chiefly in the Wirral Peninsula.

MR. J. LLOYD WILLIAMS, of University College, Bangor, was announced to lecture on Thursday, March 13th, 1902, but was unable to come on account of illness. PROFESSOR PHILLIPS, of Bangor University, however, kindly undertook MR. WILLIAMS' engagement, and delivered a deeply interesting and instructive Lecture on "The Vegetation of the Sea." The Professor showed that the great mass of the marine vegetation, upon which all marine animal life must ultimately depend for sustenance, consists of microscopic forms, taken only by means of the tow-net, and which exhibit most remarkable adaptations to prevent rapid sinking. The Lecture was illustrated by a splendid set of lantern transparencies.

A. E. GOODMAN, *Secretary.*

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## ZOOLOGICAL SECTION.

The first Meeting was held January 30th, 1902. MR. NEWSTEAD (the Curator) made the following important records:—

Waxwing *(Ampelus garrulus,* LIN.), Female.—Shot near Whitchurch, in Flintshire, December 23rd, 1901, and presented by MR. THOS. BATEMAN.

Waxwing (Male).—Shot at Aston, Nantwich, December 26th, 1901, and presented by MR. W. WARBURTON.

Great Snipe *(Gallinago major, Gm.)*—Shot at Brereton Park, September 7th, 1901, and presented by DR. T. W. E. MORETON.

Bittern *(Botaurus stellaris,* LIN.)—MR. S. CAWLEY procured a specimen at Peckforton, Cheshire, on the 9th January, 1902, and presented it to the Society's Collection.

Red-backed Shrike or Butcher Bird *(Lanius collurio).*—Seen near Bala.

Hooded Crow *(Corvus cornix,* LIN.)—One shot at Eaton, Oct. 30th, 1901.

Nightingale *(Daulias Luscinia,* LIN.)—A Male was heard in full song for several days, in May, 1901, at Christleton. It disappeared on the 14th May.

Three-bearded Rockling *(Motella vulgaris,* CUVIER).—A fine specimen was obtained by MR. BAIRSTOW, at Queen's Ferry, in February, 1902.

At the second Meeting of this Section, held April 17th, 1902, MR. F. G. EDWARDS, M.R.C.V.S., gave a Lecture entitled "Some Animal Diseases transmissible to Man," which was most interesting and instructive. There was a good attendance.

W. F. J. SHEPHEARD, *Secretary.*

## GEOLOGICAL SECTION.

Only one Meeting, on 20th February, 1902, was held in connection with this Section, upon which occasion the Chairman (MR. A. W. LUCAS, F.G.S.) read a Paper entitled "How Rocks were formed," which was illustrated by Lantern Slides and Specimens. At this Meeting, the Notes on the Flood at Glyn, December 30th to 31st, 1901, communicated by MR. F. E. ROOPER, were read and discussed. A Summary of these is re-printed on page 25.

EGERTON GILBERT *Secretary.*

## NATURAL PHILOSOPHY SECTION.

On Thursday, November 14th, 1901, MR. J. KENT SMITH read a Paper on "Water." After a rapid survey of the Chemical and Physical properties of Water, MR. KENT SMITH drew special attention to the inorganic impurities of Water, such as Salts of Calcium and Magnesium. After describing their effects on Water for Domestic and Manufacturing purposes, he suggested several economical ways for the elimination of these deleterious substances. The Paper was illustrated by experiments and lantern slides.

On Thursday, December 5th, 1901, MR. H. J. BAX read a Paper entitled "An Outline of the Theory of Evolution." In the course of his remarks, MR. BAX said that although Evolution is only a theory, it is the only possible working hypothesis for scientists at the present time. It has nothing to do with creation, and when it has served its purpose, will quietly disappear into history. Its own history is a typical argument in favour of the theory, for we can trace its beginnings amongst the writings of the early Greek Philosophers. The difficulties of classification, due to the wonderful variation in Nature, was the scientific beginning of the idea of Evolution, and Darwin's "Origin of Species," placed matters on a clearer foundation. Variation in environment, and the capacity of adaptation in living matter, gave rise to the innumerable varieties of specimens in the animal and vegetable worlds; the obscure process of natural selection causing the survival of the fittest. In this manner scientists trace a gradual development of life from the lowest forms to the highest, as represented by man. The development of a horse's limbs is a good specimen of special development, for during the tertiary period (some three million years) four of five toes disappeared. Proof of man's evolution is obtained from geological remains, and also from man himself, for he carries some 70 vestiges of useless or atrophied organs, all of which were necessary to lower forms of life.

The idea of Evolution as one of gradual and progressive growth is now traceable in all departments of intellectual activity. Our greatest living Philosopher (MR. HERBERT SPENCER) has applied the theory not only to man's physical nature, but also to his mental and moral spheres, defining Evolution as: an integration of matter and concomitant dissipation of motion, during which matter passes from an

| | | |
|---|---|---|
| indefinite<br>incoherent<br>homogeneity | to a | definite<br>coherent<br>heterogeneity; |

and during which the retained motion undergoes a parallel transformation.

On Thursday, February 13th, 1902, MR. JOHN WELSH, M.R.C.S., read a Paper on "Sleep." The various theories respecting the causation of Sleep in Plants and Animals were lucidly and concisely explained, as were also the phenomena of Hypnotism, Catalepsy, Somnambulism, and Dreams. The physiological action and chemical nature of Drugs and Stimulants were clearly demonstrated. The subject was illustrated by original diagrams.

J. BAIRSTOW, *Secretary.*

## PHOTOGRAPHIC SECTION.

The Dark Room has been put into thoroughly good order, and is now fitted with an Enlarging Lantern and an Enlarging Camera, both of which are arranged for immediate use with artificial light. The room is well-stocked with dishes and other requisites; and there are a few lockers which may be rented by Members.

Three Open Meetings have been held during the past Session, two of which were Exhibitions of Prize Slides, and the third a Lecture on "Home Portraiture," by MR. P. R. SALMON, F.R.P.S. This Lecture was given by arrangement with the Affiliation of Photographic Societies.

For the Members of the Section the following demonstrations were given:—

Postal and Greeting Cards on Velox Paper;
Lantern Slide Making;
Making of Enlarged Negatives;
Lantern Slide Testing Evening.

It has been decided to undertake a Photographic Survey of the Society's District; and the co-operation of all Members is solicited. Photographs of Old Buildings, Current Events, Geological features in Excavations, &c., will all be useful to the Committee in making this Collection.

The Photographic Section is now affiliated with the Royal Photographic Society, and each Member who pays the special Subscription of One Shilling is entitled to the "Red Book," which carries with it permission to photograph in many public buildings, &c.; and also permission to use our own Dark Room and those of other Affiliated Societies.

JOHN A. McMICHAEL, *Secretary.*

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## LITERATURE SECTION.

The two evenings allotted to this Section were filled as follows:—

1901.
Nov. 28th—"Rossetti," by REV. P. A. MILLER, M.A.

1902.
Jan. 23rd—"Tolstoi: his Life and Work," by E. OWEN ROBERTS, ESQ.

Both Papers attracted considerable audiences, were much appreciated, and led to interesting discussions. In the case of the former Paper much interest attached to some reminiscences contributed by MRS. HENRY SANDFORD; and it was generally felt that the Paper and discussion broke ground which might profitably be further cultivated. The Officers of the Section are much encouraged by the interest taken in these Papers, and are confirmed in their belief that the Section may, in the future, do much to help in the cultivation among Members of the Society of that which is of permanent solace and inspiration—a desire for and a satisfaction in the best literature.

H. G. PHILLIPSON, B.A., *Secretary.*

## ASTRONOMICAL SECTION.

During the Session the following Lectures have been delivered under the auspices of this Section :—

1901.
Dec. 12th—Lecture by MR. THOS. THORP—"The Spectroscope and its revelations."

1902.
Mar. 20th—Lecture by DR. WHICHELLO—"Drawing *v.* Photography, in the delineation of Celestial Objects."

MR. THORP is in the foremost rank as a worker with the Spectroscope, and it is a pity his Lecture was so poorly attended on account of the inclement weather.

DR. WHICHELLO is too well-known amongst us, as an earnest observer, to render it necessary to say more than that his Lecture was fully up to the high standard we are taught to expect from him.

The Officers of the Section hope to enlist the services of MR. PLUMMER and FATHER CORTIE for the coming Session.

F. W. LONGBOTTOM, *Secretary.*

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## GUILD OF ARTS AND CRAFTS (ART SECTION).

The Guild of Arts and Crafts, of which HIS GRACE THE DUKE OF WESTMINSTER is President, held an Exhibition of Decorative and Applied Art, at the Grosvenor Museum, in Room II.

The Exhibition was opened by LADY LETTICE GROSVENOR, on October 16th, 1901, in the presence of a large and appreciative audience, consisting of Members of the Society and others. THE DEAN OF CHESTER, Chairman of the Council, explained the object of the Guild, and referred to the effort now being made to promote local interest in the work of the Craftsman; at the same time he thanked those Gentlemen who, by their assistance as Guarantors, had so materially contributed to the success of the undertaking.

It was an opinion very generally expressed that for future Exhibitions it would be a great advantage if the Art Gallery could be available, the lighting therein being more suitable, and thus enabling the exhibits to be seen under more satisfactory conditions.

The Balance Sheet of the Exhibition is printed herewith.

The thanks of the Members are due to the following gentlemen, who kindly guaranteed towards the financial side of the Exhibition:—His Grace The Duke of Westminster; Sir Horatio Lloyd; The High Sheriff of Cheshire (T. Brocklebank, Esq.); H. Lyle Smyth, Esq.; Colonel Wilford LLoyd; Dr. H. Stolterfoth; H. Beswick, Esq.; W. H. Churton, Esq.; G. R. Griffith, Esq.; A. C. Preston, Esq.; Horace Mayhew, Esq.; S. Smith, Esq.; E. M. Sneyd-Kynnersley, Esq.; Jas. Tomkinson, Esq., M.P.; and Albert T. Wright, Esq.

WALTER SCHRÖDER, *Secretary.*

# GHESTER GUILD OF ARTS AND CRAFTS.

## Exhibition of Decorative and Applied Art, October, 1901.

| RECEIPTS. | £ | s. | d. |
|---|---|---|---|
| By Donations— | | | |
| His Grace The Duke of Westminster | 5 | 5 | 0 |
| Colonel Wilford LLoyd | 1 | 1 | 0 |
| Society of Natural Science, Literature, and Art | 5 | 0 | 0 |
| By Guarantors— | | | |
| H. Lyle Smyth, Esq. | 0 | 10 | 6 |
| H. Beswick, Esq | 0 | 10 | 6 |
| W. H. Churton, Esq. | 0 | 5 | 6 |
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| Albert T. Wright, Esq. | 1 | 5 | 0 |
| Sir Horatio Lloyd | 0 | 5 | 6 |
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| G. R. Griffith, Esq. | 0 | 5 | 6 |
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| Jas. Tomkinson, Esq., M.P. | 0 | 5 | 6 |
| By amount received on Sales of Exhibits | 28 | 10 | 6 |
| ,, Sales of Catalogue | 1 | 14 | 3 |
| | £48 | 15 | 9 |

| PAYMENTS. | £ | s. | d. |
|---|---|---|---|
| To Printing | 7 | 8 | 6 |
| ,, Advertising | 0 | 17 | 0 |
| ,, Joiner's time—hanging works, &c. | 0 | 12 | 8 |
| ,, Agents' charges for works specially invited, &c. | 0 | 14 | 0 |
| ,, Railway Carriage on works invited | 0 | 4 | 10 |
| ,, Clerical assistance | 1 | 16 | 6 |
| ,, Lady Curator | 5 | 16 | 5 |
| ,, Postages | 2 | 9 | 6 |
| ,, Fittings for Exhibition Room £3 4 7 | | | |
| *Less* post-sales of same 1 10 9 | | | |
| | 1 | 13 | 10 |
| Remitted to Exhibitors receipts for Sales £28 10 6 | | | |
| *Less* Commission 1 8 0 | | | |
| | 27 | 2 | 6 |
| | £48 | 15 | 9 |

21ST MARCH, 1902.—Audited and found correct,

G. P. MILN.

## PAXTON SOCIETY.

During the Winter Session a series of interesting Papers, as follows, were read at the Saturday Evening Meetings, all of which were well attended:—

1902.

Jan. 4—"The Mammals of the British Isles—Past and Present" (Illustrated by Lantern Slides) .. MR. R. NEWSTEAD, F.E.S.

,, 18—"The Culture of Chrysanthemums for Exhibition Purposes," MR. EDWIN STUBBS.

Feb. 1—"Cheshire Orchards" .. .. MR. JOHN TAYLOR.

,, 15—"The Cultivation of the *Calanthe*" .. .. MR. B. MOORE.

Mar. 1—"Stove Plants" .. THE PRESIDENT (MR. JOHN WEAVER).

,, 15—"Plants and their relation to their Food Supply" (Illustrated by Lantern Slides and Experiments) .. MR. A. E. GOODMAN.

The Annual Fruit and Chrysanthemum Exhibition proved to be a great success in every way, the Exhibits generally showing a high standard of excellence. The next Exhibition will be held in the Town Hall, on 12th and 13th November, Schedules of which are now ready, and may be had on application from the Hon. Secretary, or from any Member of the Committee.

JOHN WEAVER, *President.*
G. P. MILN, *Hon. Secretary.*

# A PLEA FOR THE STUDY OF MICRO-FUNGI

**By Mr. C. Theodore Green, M.R.C.S., L.R.C.P., F.L.S., Member British Mycologicial Society, Birkenhead.**

It is perhaps natural for a medical man to find interest in a branch of Botany which is pathological.

My present purpose is to shew how fascinating is the study of these small bodies by means of the microscope. More especially I refer now to the family of the *Uredineæ*.

We do not require large collecting tins and drying presses as we do for larger plants. The chief item of expense is a microscope with an inch and a quarter-inch objective glass. An old quarter-pound tobacco tin is all that is needed for the collection of the diseased leaves. A discarded Directory will do well to dry the leaves in. When dry they can be mounted on cards, say 4 by 5 inches, and the specimen then covered with tissue paper to prevent the spores from being rubbed off the leaves. Sections of the leaves through an affected spot can be cut with a sharp razor, if the piece of leaf is laid between the halves of split elder pith, and the whole sliced off as thinly as possible. The section will then be at right angles to the surface of the leaf, and will shew the proper relation of the fungus to the tissues of the host plant. The pieces of pith are easily removed with a needle mounted in a wooden handle. The specimen can be permanently preserved on a glass slide in glycerine and water, or in Farrant's solution, and covered and sealed in the usual way.

The *Uredineæ* attack and live upon the living tissues of plants and are found nearly everywhere.

Rust, Smut, Bunt, &c., are among the names by which these parasites are known to farmers and others. Their naked-eye appearance is as though there were spots of rust or soot on the leaves which rub off upon the finger. So far this is not very interesting or beautiful. But the beauty of these tiny organisms and the tissues they infest is soon apparent when we cut sections of them and examine with lens powers of from 90 to 500 diameters in water upon a glass slide.

Many of the *Uredineæ* look very similar under the microscope, and it is only possible to differentiate the species biologically. Flowering plants obviously differ from each other even in their seeds, but many of these minute parasites are only distinguished by the fact they only infest some one species or genus of plants. The *Uromyces* that affects the Dock cannot be made to grow upon the Lady's Fingers, and so on, though very similar in appearance. In the case of flowering plants a given seed produces one kind of plant each after its own kind, but the seed or spore of the *Puccinia* that infests species of Viola produces three distinct kinds of micro-fungus plants before it finishes its cycle of existence. First comes the *Æcidium* or pretty Cluster-cups which appear in April; these grow and die down, and when germinating produce a little later the uredospores in brown spots, and later in the summer appear darker spots containing the teleutospores. As a rule, these last formed spores remain quiescent until the following spring when the cycle of alternating generations begins over again. But some micro-fungi are heterœcious. The *Puccinia caricis* begins on the Nettle with yellow Cluster-cups, and can only develop its uredospores and teleutospores upon a totally different plant, the Hairy Sedge, *C. hirta*. So in the case of the Rust of Wheat which spoils so much good corn, the Cluster-cups are developed on the Barberry in the Spring, and their spores germinate upon the wheat ears and destroy the grain. For a long time each generation was thought to be a distinct species until research and repeated experiment proved them to be one and the same species.

## THE APPEARANCE OF SPRING FLOWERS, &c., By Mr. J. D. Siddall.

This year Wild Flowers have been very irregular in their flowering. The following table shows that the five typical plants named appeared at about average dates. Fruit trees—plums, pears, and apples—were ten days to a fortnight later. They flowered freely, giving promise of abundant crops, which, however, have been seriously reduced by the cold ungenial weather of the end of May and early June. This has not only prevented the fruit setting well, but also checked growth, and favoured the development of *Aphis* and other insect pests. Hawthorn and lilac, and all our flowering trees, flowered profusely, and looked very beautiful; but they were fully a fortnight later than usual. The reappearance of some spring flowers has also been a noticeable feature of the variable spring, and indicative of the alternations of hot and cold spells.

| | 1898. | 1899. | 1900. | 1901. | 1902. |
|---|---|---|---|---|---|
| Snowdrop .... | Jan. 6 .. | Jan. 16 .. | Feb. 20 .. | Feb. 20 .. | Feb. 1 |
| Crocus ..... | ,, 26 .. | Feb. 12 .. | ,, 20 .. | ,, 18 .. | Jan. 21 |
| Hazel..... | ,, 15 .. | ,, 10 .. | ,, 15 .. | ,, 12 .. | ,, 22 |
| Celandine .... | ,, 18 .. | ,, 12 .. | Mar. 5 .. | Mar. 2 .. | Mar. 12 |
| Coltsfoot .... | Feb. 3 .. | Mar. 12 .. | ,, 14 .. | ,, 1 .. | ,, 20 |

I had the opportunity of comparing our *Flora* in the middle of March with that of Colwyn Bay, and found the latter was about three weeks earlier than Chester for most spring flowering plants.

### VORACITY OF THE ANGLER FISH (*Lophius piscatorius*).

In June, 1892, a large example of this fish, twenty-eight and a half inches long, and apparently just dead, was left stranded on the shore by the receding tide at Llandrillo-yn-Rhos. Firmly wedged, and completely enclosed in its cavernous mouth was a circular brass tray, twelve inches in diameter, attempting to swallow which had apparently caused the creature's death.

The ancient Fishing Weir at Rhos Point is still a very interesting hunting ground, many uncommon fish being enclosed in it occasionally. Dense shoals of herring fry and other small fish, from 1½ to 3 inches long, occur in June and thereabouts, and are, unfortunately, often destroyed in great numbers by thoughtless children and others. When the sun shines upon the shoals in the shallow water, the play of colour, as the little fish glide about, is exquisitely beautiful.

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## NOTES ON THE FLOOD AT GLYN, December 30th to 31st, 1901, By Mr. F. E. Rooper.

Between 9-30 a.m., December 7th, and the same time on the 12th, the rainfall measured 1·79. From the 12th to 9-30 a.m. on the 14th the snow fell (in amount) equivalent to a rainfall of 1·20 The snow, driven by an easterly gale, formed huge drifts in the hills, blocking nearly all roads. Roofs of out-houses gave way under the weight, and large numbers of sheep and some mountain ponies were lost.

From the 14th to afternoon of Monday the 30th, the rainfall measured 3·35. From the afternoon of the 30th to 5 o'Clock on January 2nd there was a further fall of 1·50, making a total fall in 26 days of 7·84. On the afternoon of December 30th the Ceiriog was as high as, or higher than, it had ever been known before. The same evening the water at Pontfadog covered the road up to the steps of the carriages of The Glyn Valley Tramway. Early on the morning of December 31st, the road was completely washed away opposite New Mills, between Glyn and Dolywern, the river resuming its old bed before

**NOTES ON THE FLOOD AT GLYN, By Mr. F. E. Rooper** *(Continued).*

the road was made in 1859. An engine was got over the tramway at this point, at great risk, on the 31st, and soon afterwards the tramway disappeared in the flood. The ground floor of The Glyn Valley Hotel was flooded to a depth of 2ft. 10in., owing to the brook known as the Lavar getting blocked by timber swept down by the flood. Part of the large retaining wall of the main road, some 100 yards or so the Glyn side of New Mills, was washed away, and great gaps were made in the road. Considerable damage was done to the main road opposite the Hotel at Glyn, and to the road leading to the Station. The culvert under the old main road from Glyn to Chirk, at the Dryll, burst, and the road was blocked; the road from the bridge, by the sewerage tank, was in consequence flooded, and, at one time, the water was up to the bellies of passing horses. Lower down, at Pontfadog, another culvert burst, doing great damage to the road. At various points between Glyn and the old Herber Toll-gate, the river retaining-wall was swept away and the road damaged. Near the Heber Toll-gate the whole of the bed of the tram was washed away, and most of the road, the traffic having to be diverted through the adjoining field.

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## SOCIETIES ASSOCIATED,

### WITH WHICH THE SOCIETY EXCHANGES PUBLICATIONS.

Academia Nacional de Ciencias de la Republica Argentina, Cordoba.

Barrow Naturalists' Field Club.

Brighton and Sussex Natural History Society.

Bristol Naturalists' Society.

British Association (Corresponding Society's Committee).

British Museum (Natural History), Cromwell Road, London, S.W.

Burnley Literary and Scientific Club.

Cardiff Naturalists' Society.

Cassel Society of Natural Science.

Dudley and Midland Geological and Scientific Society and Field Club.

Epping Forest and County of Essex Naturalists' Field Club.

Glasgow Natural History Society.

Hertfordshire Natural History Society and Field Club.

Huddersfield Naturalists' Society.

La Société d'Histoire Naturelle de St. Wladimir á Kiew, Russie.

Leeds Naturalists' Club.

Liverpool Geological Society.

Liverpool Geological Association.

Liverpool Literary and Philosophical Society.

Liverpool Microscopical Society.

Liverpool Naturalists' Field Club.

Liverpool Science Students' Association.

Manchester Field Naturalists' Society.

Manchester Geological Society.

Manchester Microscopical Society.

Menai Society of Natural Science.

Northampton Natural History Society.

North Staffordshire Naturalists' Field Club and Archæological Society.

Norwich Science Gossip Club.

Nottingham Naturalists' Society.

Patent Office Library, 25, Southampton Buildings, Chancery Lane, London, W.C.

Postal Microscopical Society.

Quekett Microscopical Society.

Smithsonian Institution, Washington City, D.C., U.S.A.

The Missouri Botanical Garden, St. Louis, U.S.A.

United States Geological Survey.

University of Montana, Biological Station, Missoula, Montana, U.S.A.

Vatican Observatory, Rome.

Vienna Natural History Museum.

Yorkshire Naturalists' Union, Leeds.

# PAST PRESIDENTS.

1871 to 1875—Rev. Charles Kingsley, Canon of Chester.
*(Founder of the Society).*
1875 ,, 1891—Prof. T. McKenny Hughes, F.R.S.
1891-2 Alfred O. Walker, Esq., J.P., F.L.S.
1892-3 His Grace The Duke of Westminster, K.G.
1893 to 1895—W. Murray Dobie, Esq., M.D., J.P., F.R.A.S.
1895 ,, 1897—Henry Stolterfoth, Esq., M.A., M.D., J.P.
1897-8 Thomas Shepheard, Esq., F.R.M.S.
1898 to 1902—John D. Siddall, Esq.

# KINGSLEY MEMORIAL MEDAL,

Established 1877,

*"For having contributed materially to the promotion and advancement of some branch or department of Natural Science."—Vide* Trust Deed.

1877—Mrs. Chas. Kingsley (In Memoriam).
1878—John Price, M.A
1879—Sir Philip de Malpas Grey-Egerton, Bart., F.R.S.
1880—Prof. T. McKenny Hughes, F.R.S.
1881—D. Mackintosh, F.G.S.
1882—Issac Byerley, M.R.C.S., F.L.S.
1883—George W. Shrubsole, F.G.S.
1884—Alfred Osten Walker, F.L.S.
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1886—Henry Stolterfoth, M.A., M.D.
1887—William Shone, F.G.S.
1888—Thomas Shepheard, F.R.M.S.
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1890—Rev. Chas. Wolley-Dod, M.A.
1891—Robert Newstead, F.E.S.
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1893—Edmund J. Baillie, F.L.S.
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1896—Rev. Arthur H. Fish, B.A., B.Sc.
1897—William Henry Dobie, M.B.
1899—W. F. Lowe, A.R.S.M., F.I.C., F.C.S.
1900—Joseph Arkle.
1901—Thomas Arthur Coward.

# KINGSLEY MEMORIAL PRIZES,

(OF £5 AND UPWARDS)

Established 1877,

*"For the reward, encouragement, and the advancement of the pursuit and study of Natural Science."—Vide* Trust Deed.

| | | | |
|---|---|---|---|
| 1878 | Helen Smith ..... | £5 | *Herbarium of Flowering Plants.* |
| | Edwin W. Okell .... | 5 | |
| 1879 | George Shrubsole .. | 5 | *Carboniferous Fossils.* |
| 1881 | E Hopkins ..... | 5 | *Cryptogamous Plants.* |
| 1882 | George Shrubsole .. | 10 | *Corals of the Mountain Limestone.* |
| 1886 | Robert Newstead .. | 10 | *Hymenoptera.* |
| 1887 | John Lyon Denson .. | 5 | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888 | Lilian E. Tomlin .... | 5 | *Coleoptera.* |
| 1889 | Edith C. Tomlin .... | 5 | *Diptera and Hymenoptera (Terebrantia)* |
| | W. E. Sharp ..... | 5 | *Coleoptera.* |
| 1890 | Alfred J. Nixon .... | 10 | *Land and Fresh-Water Shells.* |
| 1892 | W. E. Sharp ..... | 10 | *Coleoptera.* |
| 1896 | Alfred Newstead | £5 5s. | *Hydradephaga (Water Beetles) and Life Histories of Insects.* |
| 1897 | Alfred Newstead | £5 5s. | *Life Histories of Insects.* |
| 1900 | Miss M. Bowers .... | £5 | *Collection of Botanical Specimens.* |
| 1901 | A. E. Goodman .. | £5 5s. | *Collection of Photo-Micrographs with Notes and Observations.* |

Amounts less than £5 are also awarded annually.

## Additions to the Society's Library, 1901-1902.

### DONATIONS.

Birds, British (Saunders). *Mr. John Day.*
Birds, Catalogue of. *Mr. Howard Saunders.*
Birds of Ireland. *Mr. Howard Saunders.*
Birds of Yorkshire *Mr. W. E. Clarke.*
Catalogue of British Hymenoptera. *Trustees of British Museum.*
"Field," 1901 (complete). *Mr. Rowson.*
"Field," January 4th to June 14th, 1902. *Free Library.*
Geologists' Association, List of Members, 1902.
Index of Local Fungi: Wirral (Dr. Theodore Green). *The Author.*
Journal of Conchology, 1886—1893. *Mr. G. Shrubsole.*
Malacostracan Fauna of the Mediteranean (by A. O. Walker). *The Author.*
Micro-Photographs. *A. E. Goodman.*
Naturalists' Journal, for the year 1900 to April, 1901. *Mr. Brockton Tomlin.*
Proceedings of the Dorset Natural History and Antiquarian Field Club, Vols. 21, 22. *Mr. T. Shepheard.*
Quarterly Journal of the Geological Society, for the years 1886–1894. *Mr. G. Shrubsole.*
Reminiscences of a Yorkshire Naturalist. *Executors of the late Prof. Williamson.*
Report (Annual) of the Ohio State University.
,, of the Science Gossip Club. *Mr. Brockton Tomlin.*
,, of the Cape Nome Gold Region.
,, British Association, 1901.
Transactions of the Wisconsin Academy.
United States Geological Survey, 1898-1900.

### BY EXCHANGE.

Flora of Yorkshire, Part 25.
Journal of the Northampton Natural History Society, March to December, 1901.
North American Fauna, Nos. 20 and 21.
Proceedings of the Liverpool Literary and Philosophical Society.
,, ,, Liverpool Naturalists' Field Club.
,, ,, Manchester Field Naturalists' Society.
,, ,, Geologists' Association, Parts 3, 4, and 5, Vol. XVII.
,, ,, Liverpool Geological Society, 1900-1901.
Report (Annual) of the Nottingham Naturalists' Society, 1900-01.
,, of the North Staffordshire Field Club, 1901-02.
,, of the Missouri Botanical Garden.
,, of the Smithsonian U.S. National Museum.
Reports (Annual) Smithsonian Institute, 1897—1900.
Transactions of the Barrow Naturalists' Field Club.
,, ,, Manchester Microscopical Society, 1900.
,, ,, Yorkshire Naturalists' Union, 1898.
,, ,, Cardiff Naturalists' Society, 1900-1901.
,, ,, Manchester Geological Society, Vol. XXVII., Part VI.; Vol. XXXII., Part VII.

### BY PURCHASE.

Monograph of British Coccidæ, Vol. I. (R. Newstead). Ray Publication.
British Tyroglyphidæ, Vol. I. (Michael). Ray Publication.
"Naturalist," The, Nos. 531—544, from April, 1901 to May, 1902.
Palæontographical Society, Vol. 55, 1901.
Transactions of the Entomological Society of London.
"Entomologist" for 1901.
"Zoologist" for 1901.

## HONORARY MEMBERS.

*Those marked (*) have read or contributed Papers at the Society's Meetings.*

*Avebury, The Right Hon. Lord, F.R.S. ...*Down, Farnborough, Kent*
*Ball, Sir Robert S., F.R.S. ...*Observatory, Cambridge*
Barrett, Chas. G., Esq., F.E.S. ... ...*39, Linden Grove, Nunhead, London, S.E.*
Candolle, Mons. Casimir De ...*Geneva*
Cannizaro, Prof. ...*Rome*
*Carruthers, W., Esq., F.R.S. ...*The British Museum, South Kensington, London, S.W.*
Credner, Dr. Hermann ...*Leipzic*
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*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their Names are retained on the Society's Books, and their Subscriptions considered due, until notice has been given to the contrary, according to Rule* 8.

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Cook, Mr. R. .....7 The Groves
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Denson, Miss Adelaide ..... „ „
Denson, Mr. J. Lyon ..... „ „
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Denson, Mrs. ..... „ „
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Dickinson, Mrs. ..... „ „
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Egginton, Mrs..... ..... ,, ,,
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Evans, Miss Charlotte ..... ,, ,,
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Frater, Mrs. ..... " "
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Frater, Mrs. ..... " " "
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Freeman, Mrs. ..... " "
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Griffiths, Mrs. ..... " "
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Griffiths, Miss Bessie ..... " "
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Gunton, Miss .....2 Church street

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Haswell, Mr. Geo. W.....70 Bouverie street
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Hawkins, Mr. J. M. .....Glan Aber park
Haycock, Rev. H. E.....59 Parkgate road
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Higgins, Miss Millie ..... ,, ,,
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Hignett, Mrs. T. H... .....Shandon, Hough green
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Hincks, Mrs..... ,, ,,
Hindhaugh, Mrs .....35 Parkgate road
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Hobday, Mr. J. .....Alexandra Villa, Liverpool road
Hobday, Mr. E..... ,, ,,
Hobday, Mr. Wm. Edward.....22 The Groves
Hodge, Mr. J. R. .....27 Liverpool road
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Hodge, Miss Constance ..... ,, ,,
*Hodges, Mr. W. .....62 Hough green
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Hodkinson, Mrs .....39 White Friars
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Hopley, Mrs. ..... " "
Hopton, Mrs. .....3 Cheyney road
Hopwood, Miss .....The Deanery
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Hornby, Mrs. ..... " "
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Hostage, Mrs..... " "
Hostage, Miss .....24 Eaton road
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Howson, Miss ..... " " "
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Howick, Mr. T. S. Keith.....22 St. Martin's fields
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Hughes, Miss .....Wepre Cottage, Connah's Quay
Humberston, Miss.....Newton Hall, Chester
Humphreys, Mr. E. Noel.....Caer y Cael, Hoole
Humphreys, Mrs. ..... " "
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Hunter, Mr. Jas. .....Maisonette, Hough green
Hunter, Mrs. ..... " "
Hunter, Mr. Jas. de Graaff .....Pembroke College, Cambridge
Hunt, Mr. L. J.....Marlborough House, St. John street
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Hutchings, Mrs..... " "
Hutchinson, Mr. Thos. .....10 Belgrave street
Huxley, Miss M. E. .....41 Cheyney road
Huxley, Miss Ann ..... " "

Illingworth, Mr. F. H.....34 Liverpool road
Illingworth, Mrs. ..... " "

Jack, Mr. A. S.....Belle Vue, 72 Hough green
Jackson, Miss.....52 Hough Green
Jackson, Mr. Robert .....8 Denbigh street
James, Rev. T. D. .....Llanerfyl Rectory, Welshpool
*James, Rev. Frank, M.A. .....Rossett Vicarage, near Wrexham
James, Mr. J. F. .....17 Mount Pleasant, Saltney
*Jebb, Mr. G. R., C.E.....Fairyfield, Great Barr, Birmingham
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Jessop, Mrs. M. M. .....6 Spring gardens, Hoole
Johnson, Major .....2 White friars
*Johnson, Mr. M., L.D.S.I. .....21 York villas, Lorne street
Johnson, Mr. Thomas C. .....Bod Asaph, Chichester street
Johnson, Mr. Noel .....Warwick Road Hall, Bowdon
Johnson, Mr. Sidney M. .....18 Bouverie street
Johnson, Mrs. Mayo .....10 Lorne street
Jolliffe, Mr. H. D.....Queen's park
Jones, Miss .....3 Lorne street
Jones, Mrs. Edward .....1 Derby place, Hoole
Jones, Mr. Jno. .....17 Lorne street (North)
Jones, Mrs..... " " "
Jones, Mr. David Brellisford ....11 St. Anne street
Jones, Mr. W. S. .....North and South Wales Bank
Jones, Mr. Owen E., J.P. .....Tynrheol, Amlwch
Jones, Mr. Fred. .....26 Frodsham street
Jones, Mr. H., A.C.A. .....Gwynedd, 131 Boughton
Jones, Miss .....2 Hunter street

Jones, Mrs. W. H. .....4 Abbey street
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Jones, Mr. Henry .....98 Watergate flags
Jones, Mr. O. R., H.M.I.M. ....5 Spring Gardens, Hoole
Jones, Mr. Percy Barrett .....26 Upper Northgate street
Jones, Mr. Robert .....Cambrian view
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Joyce, Rev. F. Hayward.....9 Abbey square

Kelsall, Miss H. .....Abbot's court, Liverpool road
Kenyon, Mr. G. A., M.B. .....Flookersbrook
Kenyon, Mrs. ..... ,,
Kember, Miss M. .....8 The Groves
Killick, Mr. George .....Eaton, Chester
*King, Dr. H. W. .....26 Nicholas street
King, Mrs. ..... ,, ,,
*Kingsley, Miss ..... .....Keys, Eversley, Winchfield
Knight, Miss ..... .....8 Eastgate row
Knight, Miss .....4 Eaton road
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Knowles, Miss ..... ,, ,,
Kynnersley, Mr. E. M. Sneyd ..Boughton Lodge

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Laing, Miss S. C. ..... .....7 Chester street, Saltney
Lamont, Mr. A..... .....Arlington, Pole Hill, Heswall
Lanceley, Mr. R. H.....Victoria road
Latham, Mr. J. S..... .....Green bank, Liverpool road
Latham, Mrs..... ..... ,, ,,
*Lawrence, Dr. A. ..... .....The Asylum, Chester
Laybourne, Mr. J. H. ..... .....21 The Groves
Laybourne, Mrs. ..... ..... ,, ,,
Ledsham, Mr. Wm. ..... ....Coal Exchange
Lees, Mr. W., M.R.C.S.....The Bars
Leete, Mrs.....Vicarage road, Hoole
Lewis, Rev. J. S., M.A. .....The Vicarage, Ruabon
Littler, Miss ..... .....132 Overleigh road, Handbridge
Lloyd, His Honour Sir Horatio ..Stanley place
*LLoyd, Colonel Wilford .. .....Eccleston Hill, Chester
LLoyd, Mrs. ..... ,, ,,
Lloyd, Miss M. E.....13 Chichester street
Lloyd, Miss C. ..... .....62 Princess street
Lloyd, Mr. F. Horatio ..... .....11 Stanley place
Lloyd, Mrs..... ..... ..... ,, ,,
Lloyd, Mr. G..... ..... .....38 Duke street
Lockwood, Mrs..... ..... .....7 Queen's park
Lockwood, Miss Amy .....90 Foregate street
Lodge, Mr. Geo. T. .....St. Catherine villa, Lord street
Long, Mrs. ..... .....11 Lumley road
Long, Miss F..... ..... ,, ,,
*Longbottom, Mr. F. W. .....Haslemere, Queen's park
Longbottom, Mrs..... ..... ,, ,,
Lowe, Miss C. H. .....50 Hough green
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. } 18 Hough green
Lowe, Mrs..... ..... ,, ,,
Lowe, Mr. Jas. F., B.A. .....Dee banks
*Lucas, Mr. A. W., F.G.S. .....Queen's park
Lumby, Mr. Arthur H..... .....17 George street

Lumby, Mr. Ernest Arthur .....15 George street
Lund, Mr. R. S.....12 Bridge street
Lutener, Rev. Wm. .....Beech Holme, 8 Curzon park

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Mr. G. E. ..... " "
*Macdonald, Miss Eva ..... " "
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MacGillycuddy, Mrs..... " "
Maddocks, Mr. Frank .....Riverlea, Dee banks
Manley, Mr. H. .....Aston, Nantwich
Mann, Mr. A., M.B.....Newgate street
Mann, Mrs..... " "
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Marriott, Mr. J. W. .....The Grosvenor Museum
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Marston, Mr. Chas. .....11 Victoria terrace, Mold
Mason, Mr. F. B. .....1 Exton park
Mason, Mrs. ..... " "
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
McCulloch, Mr. A. M.....Lime Grove
McCulloch, Mrs. ..... " "
McCulloch, Mr. H. ..... " "
*McMichael, Mr. J. A., B.A., B.Sc..39 Parkgate road
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Meacock, Miss .....White Friars Cottage
Meacock, Miss .....Bridgegate House, Bridge place
Meeres, Mrs. E. A. .....The Laurels, 48 Hough green
Meeres, Miss Constance ..... " "
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Miln, Mrs. ..... " "
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Minns, Mr. Alfred.....122 St. Anne street
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Minshull, Mr. C. H.....5 " "
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Moss, Mr. Samuel, M.P. .....56 Hough green
Moss, Mrs..... " "
Mostyn, Sir Pyers W., Bart. ....Talacre, Holywell
Mostyn-Roberts, Mrs. R.....Bryntirion, Chester

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Mowle, Mrs. ..... " " "
Moss, Mr. W. S. ..... Haverthwaite, Newry park
*Mules, Dr. ..... The Old Parsonage, Gresford
Musgrave, Mr. J. ..... 45 White friars
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Musgrave, Mr. A. J. ..... " "
Musgrave, Miss ..... " "
Muspratt, Mr. E. J. ..... Within Croft, Dee banks
Muspratt, Miss ..... " "

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New, Mr. William J. ..... " "
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Newman, Mrs. ..... " "
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Niven, Miss ..... " "
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Parry, Miss Kate ..... Blossoms Hotel
Parton, Miss ..... 4 Grey friars
Partridge, Mr. Arthur C. ..... 6 Abbey street
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Payne, Miss A. ..... " "
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Powell, Miss .....38 Eastgate row
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Priest, Mr. W. B.....Gresford
Prichard, Miss .....9 The Groves
Pringle, Mr. Wm.....30 Cambrian Crescent
Pritchard, Mr. W.....28 St. Martin's fields
Pritchard, Mr. Harold .....The Hollies, Upton park
Pritchard, Miss .....George street
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Rogers, Mrs. ..... ,, ,,
Rogers, Mr. C. W. .....Watergate flags
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Room, Mrs. .....2 Mount pleasant, Saltney
Room, Miss ..... ,, ,,
Rossiter, Miss G. M.....6 South view, Eaton road
Rossiter, Miss C. M ..... ,, ,,
Royle, Mrs.....Hough Green House
Royle, Mr. W. .....20 Bouverie street
Royle, Mrs..... ,, ,,
Royle, Mr. J. W. .....38 Eastgate row

Salmon, Miss Maud .....30 Hough green
Sandbach, Mr. S. H., J.P. .....Cherry Hill, Malpas
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Savage, Colonel.....The Limes, 54 Hough green
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*Shone, Mr. W., F.G.S. .....Upton park
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Siddall, Mrs. .....,,
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Siddall, Mr. W.....,,
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Smith, Mrs. .....,,,,
Smith, Mr. S. G. .....,,,,
Smith, Miss L. M. .....119 Foregate street
Smith, Mr. Emanuel L. .....14 St. Werburgh street
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Smith, Miss .....,,
Smith, Miss E. A. .....,,
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Stanyer, Mr. William .....30 Newgate street
Stevens, Mr. T. .....14 Eastgate row
Stewart, Mrs.....13 Stanley place
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Stokes, Miss .....c/o Miss Glascodyne, 4 King's buildings
*Stolterfoth, Dr., M.A., J.P. ....1 Grey friars
Stolterfoth, Mrs.....,,
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Welsby, Mrs. ..... ,, ,,
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Wilkinson, Mr. R. .....51 Cambrian view
Wilkinson, Miss ..... ,, ,,
Williams, Mr. J. E. .....Westminster buildings
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Williams, Miss .....96 Tarvin road
Williams, Mr. R. J. .....8 Eaton road
Williams, Miss Aldersey .....100 Watergate flags
Williams, Mr. James.....24 Hough green
Williams, Mr. Lewis, M.B., C.M...Hoole
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Williams, Mr. A. T. .....15 Cheyney road
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Wolfenden, Mr. A. .....21 Hough green
Wolfenden, Miss Marion ..... ,, ,,
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Wood, Mrs. A. .....1 King's buildings
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Wright, Mrs. ..... ,, ,,
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***** The Catalogue of Books in the Society's Library may be obtained at 4, Eastgate Row; or from the Museum; price 3d. each.**

☞ **Copies of Nos. II. and III. of the Society's Proceedings (price 2/6 each), No. IV. (5/-), and No. V. (2/6), may be obtained at the Museum.**

*Special attention is directed to the accompanying Notice giving particulars of the List of Lepidoptera found in Cheshire, Flintshire, Denbighshire, Carnarvonshire, and Anglesea (Proceedings No. V.), which has recently been published by the Society. Copies may be obtained from the Curator, at the Museum, price 2/6 each (Post free, 2/8).*

# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY, 1871).

BRITISH MUSEUM
NATURAL HISTORY

## THIRTY-SECOND

# ANNUAL REPORT

INCLUDING

## STATEMENTS OF ACCOUNTS, &c.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art, by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Eight Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any Candidate for Membership of the Society, with those of a Proposer and a Seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

7.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each—except to the Annual General Meeting, to which Members only are admitted.

8.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

9.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

10.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

11.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

12.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

13.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

14.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement made up to the end of April, and duly audited, shall also be submitted, and read if desired.

15.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

16.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

17.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

18.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1903-1904.

## President:

REV. A. H. FISH, B.A., B.Sc.

## Vice-Presidents:

PROF. T. McKENNY HUGHES, F.R.S. | H. STOLTERFOTH, ESQ., M.A., M.D., J.P.
A. O. WALKER, ESQ., J.P., F.L.S. | T. SHEPHEARD, ESQ., F.R.M.S.
W. M. DOBIE, ESQ., M.D., J.P., F.R.A.S. | G. R. GRIFFITH, ESQ.
J. D. SIDDALL, ESQ.

## Officers of Sections:

### BOTANICAL.

CHAIRMAN—MR. J. D. SIDDALL ... ... ... 23, *Eaton Road*
SECRETARY—MR. A. E. GOODMAN ... ... ... *Oakdene, Tarvin Road*

### ZOOLOGICAL.

CHAIRMAN—DR. W. HENRY DOBIE ... ... ... 2, *Hunter Street*
SECRETARY—MR. W. F. J. SHEPHEARD, F.C.S. ... *Bridge Street Row*

### GEOLOGICAL.

CHAIRMAN—MR. A. W. LUCAS, F.G.S. ... ... *Queen's Park*
SECRETARY—MR. EGERTON GILBERT ... ... 21, *Eaton Road*

### NATURAL PHILOSOPHY.

CHAIRMAN—MR. G. WATMOUGH WEBSTER, F.C.S. *Brook Lodge, Brook Lane*
SECRETARY—MR. J. BAIRSTOW, F.C.S. .. ... ... *Burley, Queen's Park*

### MICROSCOPICAL.

CHAIRMAN—DR. STOLTERFOTH ... ... ... 1, *Grey Friars*
SECRETARY—MR. J. D. SIDDALL ... ... ... 23, *Eaton Road*

### PHOTOGRAPHIC.

CHAIRMAN—DR. STOLTERFOTH ... ... ... ... 1, *Grey Friars*
SECRETARY—MR. J. A. McMICHAEL, B.A., B.Sc.... 39, *Parkgate Road*

### LITERATURE.

CHAIRMAN—REV. A. H. FISH, B.A., B.Sc. ... ... *Arnold House*
SECRETARY—DR. J. T. ROBERTS ... ... ... ... *Dorchester House*

### ASTRONOMICAL.

CHAIRMAN—DR. W. M. DOBIE .. ... ... ... *Hunter Street*
SECRETARY—MR. F. W. LONGBOTTOM ... ... *Haslemere, Queen's Park*

### ART.

CHAIRMAN—THE VERY REV. DR. DARBY ... ... *The Deanery*
SECRETARY—MR. WALTER SCHRÖDER, A.R.C.A.... 32, *Eaton Road*

## Hon. Treasurer:

MR. JOHN SIMON, 4, *Eastgate Row*

## Hon. Secretaries:

*Scientific*—DR. STOLTERFOTH, M.A., 1, *Grey Friars*
*General* { MR. G. P. MILN, *Milnholme, Brook Lane*
{ MR. W. F. J. SHEPHEARD, F.C.S., *Bridge Street Row*

## Hon. Librarian:

MR. R. NEWSTEAD, A.L.S., F.E.S, *The Grosvenor Museum*

## Committee:

THE ABOVE OFFICERS *(Ex-officio)*,
AND

REV. J. L. BEDFORD, M.A, F.L.S. | MR. E. HODKINSON
MR. J. DAY | DR. KING
MR. J. LYON DENSON | MR. W. SHONE, F.G.S.
DR. J. DUFF | MR. W. W. SIDDALL
DR. GRANGER | DR. JAMES TAYLOR
DR. HAMILTON | MR. J. R. LE B. TOMLIN, M.A., F.E.S.

## Hon. Auditors:

MR. BERESFORD ADAMS. MR. E. NOEL HUMPHREYS, C.A.

## Curator:

MR. R. NEWSTEAD, A.L.S., F.E.S., *The Grosvenor Museum*

## Assistant Secretary:

MR. H. NEW.

## Representatives of the Society upon the Grosvenor Museum Management Committee.

REV. A. H. FISH, B.A., B.Sc. | MR. G. P. MILN | MR. J. BAIRSTOW, F.C.S.
MR. J. D. SIDDALL | MR. JOHN SIMON | MR. G. WATMOUGH WEBSTER, F.C.S.

## HON. SCIENTIFIC SECRETARY'S REPORT.

ON again addressing the Members of our Society as your Scientific Secretary, I feel that, after so many years, there is not much that I can add to what has been already said. The Society has good and efficient General Secretaries who keep the Members well informed as to what is being done.

The most important scientific event during the year has been the publishing of the list of *Lepidoptera* by Mr. George O. Day, assisted by others of our Members. This work has been very favourably received; and although not a Book that is intended for general reading, it will prove one of those useful Books that will have to be continually in the hands of those who take an interest in the subject. The price at which it is sold ought to place it within the reach of all our Members. The Society will be doing useful work as long as it continues to publish lists of what comes immediately under its own observation.

Our Curator (Mr. Newstead) is still at work for the RAY SOCIETY in completing his Monograph on the *Coccidæ*, which is a work that reflects great credit on himself, and in a lesser degree on the Society that can number him amongst its Members.

The Excursions and Lectures are well attended, and if we are to judge by numbers, the Society has never been in a more flourishing condition; this, to a certain extent, is due to our Presidents, who have thrown their whole heart and soul into stimulating the Members in the pursuit of scientific enquiry.

This keeping alive of mental activity is one of the uses for which such Societies as ours exist; and although athletics are at the present day much in evidence, still we must always remember that the object of the "*corpus sanum*" is the "*mens sana*," and that the higher part of man's nature must not be entirely neglected in order to cultivate physical prowess.

HENRY STOLTERFOTH,
*Scientific Secretary.*

## HON. SECRETARIES' REPORT.

In presenting the Thirty-second Annual Report, your Committee have pleasure in recording a period of increased prosperity for the Society.

The present membership of the Society is 971, made up as follows:—

| | |
|---|---|
| Honorary Members - - - | 29 |
| Corresponding Members - - | 24 |
| Ordinary Members - - - | 918 |
| Total - - - | 971 |

A careful perusal of the Balance Sheet will shew that the finances of the Society are in a thoroughly sound condition, for although there has been an extraordinary expenditure of nearly £70 during the year, the deficit is only £8 1s. 7d., which your Committee feel confident will very soon be cleared off.

This extraordinary expenditure has been caused mainly by this Society having been called upon to pay its portion (£48 15s. 8d.) of the debt on the Museum Maintenance Fund; and by the repainting and redecorating of the Lecture Theatre, amounting to £16, which the Society voluntarily undertook to do.

The attendance of Members at the Summer Excursions and Field Meetings, as well as at the General and Sectional Meetings held during the Winter months, has been quite up to the average.

Your Committee have met fourteen times during the year for the transaction of the Society's business; and the general attendance here shews an increase upon previous years.

There were eleven Excursions and Field Meetings held during the Summer months, as follows:—

| | 1902. |
|---|---|
| Beeston Castle and the Peckforton Hills | May 28th |
| Burton Point and the Denhall Foreshore | June 4th |
| Rhydymwyn and "The Leet" | ,, 11th |
| Bache Hall Gardens and Pinetum | ,, 19th |
| Dawpool, West Kirby, and Hilbre Island | July 9th |
| Tarvin and Hockenhull Platts (Cycling Excursion) | ,, 16th |
| Shotwick Park, Woods, and Gardens | ,, 23rd |
| Delamere Forest and Meres | ,, 30th |
| Aston Hall Colliery and Hawarden | August 27th |
| Eaton Gardens | September 3rd |
| Sandycroft Engineering Works | ,, 17th |

At the Conversazione held in October last, there were proposed no fewer than 45 new Members, which made the grand total of membership up to over one thousand; this

being a record number, which might have been maintained but for the fact that we have lost heavily by deaths, removals, and withdrawals since that time.

It is, however, very gratifying to find that our present membership of 971 is 17 more than it has been at any previous Annual General Meeting.

During the Winter Session there were nine General Meetings, and fifteen Sectional Meetings, as follows:—

## GENERAL MEETINGS.

1902.

Oct. 15th—Annual Conversazione.

Nov. 6th—"St. Kilda—Its People and its Natural History"—
MR. R. NEWSTEAD, A.L.S., &c.

Dec. 4th—"The Water Babies": a popular description of the Water-plants and Animals of the District—MR. J. D. SIDDALL.

1903.

Jan. 22nd—"Chester Weather": a record of 25 years—
REV. J. CAIRNS MITCHELL, B.D., F.R.A.S.

Feb. 5th—"An Alpine Tour"—REV. FRANK JAMES, M.A. (Rossett).

Mar. 5th—"Wireless Telegraphy"—REV. A. H. FISH, B.A., B Sc.

,, 26th—"Colwyn Bay in the Ice Age"—
A. O. WALKER, ESQ., J.P., F.L.S.

Apr. 2nd—"Some recent researches on the Sun's Surface"—
REV. A. L. CORTIE, S.J., F.R.A.S.
(Stonyhurst College Observatory).

*** The above Lectures were illustrated by Lantern Slides, &c.

,, 15th & 16th—Exhibition of Spring Flowers, by
MEMBERS OF THE CHESTER PAXTON SOCIETY AND OTHERS.

## SECTIONAL MEETINGS.

### BOTANICAL.

1902.

Nov. 13th—"Interesting aspects of the study of Micro-fungi," by
DR. C. THEODORE GREEN, F.L.S., &c. (Birkenhead).

1903.

Feb. 19th—"Curiosities of a Blade of Grass," by MR. A. E. GOODMAN.

### ZOOLOGICAL.

1903.

Jan. 8th—"Notes and observations on Zoology during the past year," by
DR. HENRY DOBIE, MR. J. ARKLE, MR. J. THOMPSON, and MR. SIDNEY S. CUMMINGS.

Apr. 30th—"Zoological gleanings from my Diary," by
MR. R. NEWSTEAD, A.L.S., &c.

### GEOLOGICAL.

1903.

Feb. 12th—"The British Isles in the Glacial Period, compared with the present glacial conditions of Norway, Greenland, and other Arctic Lands," by MR. W. SHONE, F.G.S.

## NATURAL PHILOSOPHY.

1902.
Nov. 20th—"The Battle of Lights—Oil, Gas, and Electricity," by
MR. J. BAIRSTOW, F.C.S.

1903.
Feb. 26th—"Some Romantic Chapters in the study of Science," by
MR. JOHN WELSH, L.R.C.P., M.R.C.S., &c.

## MICROSCOPICAL.

1903.
Jan. 29th—Demonstration Evening, by MEMBERS OF THE SECTION.

## PHOTOGRAPHIC.

1902.
Dec. 18th—"Flash Light Photography," by MR. S. MATHER WEBSTER.
Lantern Slides, by MEMBERS.

1903.
Apr. 23rd—"Natural Colour Photography," by MR. J. D. SIDDALL.

## LITERATURE.

1902.
Dec. 11th—"Charles Kingsley—Social Reformer and Novelist," by
MR. F. W. PARKER.

1903.
Mar. 19th.—"The Early Literary Life of Benjamin Disraeli (Earl of Beaconsfield)," by MR. J. M. HAWKINS.

## ASTRONOMICAL.

1902.
Nov. 27th—"How we charm their secrets from the Sun and Stars: the romance of the Spectroscope," by
REV. ROBT. KILLIP, F.R.A.S., &c. (Liverpool).

1903.
Mar. 12th—"Some strange Celestial Phenomena," by
SAML. FELLOWS, ESQ., F.R.A.S. (Wolverhampton).

## ART.

1903.
Jan. 15th—"Books and their Illustrations"; "The Book in which I am most interested, and why"—Discussion opened by MR. W. SCHRÖDER, A.R.C.A.

NOTE.—Most of the above Sectional Meetings were suitably illustrated by Lantern Slides, &c.

The Annual Conversazione proved to be a most successful function, the exhibits by Members being exceptionally good. A great measure of this success was also due to the attendance of the Earl and Countess Beauchamp, who came specially from Madresfield Court to take part in the proceedings.

Your Committee wish to acknowledge the help rendered by Members of the Paxton Society, not only in connection with the Conversazione, but more especially in connection with the Exhibition of Spring Flowers, which was this year of a most meritorious character, and extended over two days.

GEORGE P. MILN, } *Hon. Gen.*
W. F. J. SHEPHEARD, } *Secretaries.*

MAY 14th, 1903.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1903.

| Dr. | £ s. d. | £ s. d. |
|---|---|---|
| By Balance from Last Account .. .. | | 26 14 4 |
| ,, 860 Subscriptions for year 1902-3 @ 5/- | 215 0 0 | |
| ,, 36 Arrears ,, 1901-2 @ 5/- | 9 0 0 | |
| ,, 7 ,, ,, 1900-1 @ 5/- | 1 15 0 | |
| | | 225 15 0 |
| MEMO. OF ARREARS. | | |
| 47 Members for 1 year, 1902-3 ... | ...£11 15 0 | |
| 6 ,, 2 years, 1901-3 ... | 3 0 0 | |
| 2 ,, 3 ,, 1900-3 ... | 1 10 0 | |
| 55 | £16 5 0 | |
| ,, Gross Receipts from Excursions— | | |
| To Beeston Castle .. .. .. | 3 7 3 | |
| ,, Burton Point .. .. .. | 1 13 3 | |
| ,, Rhydymwyn .. .. .. | 7 1 3 | |
| ,, Hilbre and West Kirby .. .. | 2 10 8 | |
| ,, Shotwick Park .. .. .. | 0 16 6 | |
| ,, Delamere .. .. .. .. | 2 6 3 | |
| ,, Aston Hall Colliery and Hawarden | 6 6 0 | |
| ,, Eaton Hall Gardens .. .. | 0 18 0 | |
| ,, Sandycroft .. .. .. .. | 1 8 0 | |
| | | 26 7 2 |
| ,, Receipts from Conversazione .. .. | | 11 14 5 |
| ,, Receipts from Lectures and Evening Meetings— | | |
| Mr. Newstead's .. .. .. | 1 5 0 | |
| Mr. Bairstow's.. .. .. .. | 0 2 0 | |
| Rev. R. Killip's .. .. .. | 0 4 0 | |
| Mr. Siddall's 1st .. .. .. | 0 4 0 | |
| Rev. J. Cairns Mitchell .. .. | 0 1 0 | |
| Rev. F. James .. .. .. | 1 6 0 | |
| Mr. Shone .. .. .. .. | 0 2 0 | |
| Rev. A. H. Fish .. .. .. | 8 5 0 | |
| Mr. J. M. Hawkins .. .. .. | 0 3 0 | |
| Rev. A. L. Cortie .. .. .. | 0 16 0 | |
| Mr. Siddall's .. .. .. .. | 0 1 0 | |
| | | 12 9 0 |
| ,, Donation from Paxton Society's Show .. .. | | 4 14 0 |
| Adverse Balance .. .. .. | | 8 1 7 |
| | | £315 15 6 |

| Cr. | £ s. d. | £ s. d. |
|---|---|---|
| To Management Committee .. .. | | 75 0 0 |
| ,, Lantern Account .. .. .. .. | | 8 8 0 |
| ,, Natural History Museum and Library .. | | 27 12 7 |
| ,, Postages .. .. .. .. .. | | 24 13 0 |
| ,, Printing, Stationery, and Advertising .. | | 44 18 3 |
| ,, Gross Expenses in connection with Excursions— | | |
| Beeston Castle .. .. .. | 3 5 8 | |
| Burton Point .. .. .. .. | 1 1 6 | |
| Rhydymwyn .. .. .. .. | 5 13 3 | |
| Hilbre and West Kirby .. .. | 2 14 0 | |
| Shotwick Park.. .. .. .. | 0 12 0 | |
| Delamere .. .. .. .. | 1 19 6 | |
| Aston Hall and Hawarden .. .. | 6 6 0 | |
| Eaton Hall Gardens .. .. .. | 0 12 9 | |
| Sandycroft .. .. .. .. | 1 0 2 | |
| | | 23 4 10 |
| ,, Expenses in connection with Conversazione | | 23 10 2 |
| ,, ,, ,, Lectures, &c.— | | |
| Rev. J. Cairns Mitchell .. .. .. | 0 3 6 | |
| Rev. A. H. Fish .. .. .. | 0 7 6 | |
| Rev. A. L. Cortie .. .. .. | 3 3 0 | |
| | | 3 14 0 |
| ,, Salary and Honorarium—Assistant Secretary | | 15 0 0 |
| ,, Painting Lecture Theatre .. .. .. | | 16 0 0 |
| ,, Donation to Museum Maintenance—Society's proportion of Debt .. .. .. | | 48 15 8 |
| ,, Subscriptions— | | |
| Palæontographical Society .. .. | 1 1 0 | |
| Entomological Society .. .. | 1 1 0 | |
| Ray Society .. .. .. .. | 1 1 0 | |
| Royal Photographic Society .. | 1 1 0 | |
| | | 4 4 0 |
| ,, Collecting Subscriptions .. .. .. .. | | 0 15 0 |
| | | £315 15 6 |

Examined with the Accounts and Vouchers relating thereto and found to be correct, shewing a balance of £8 1s. 7d. due to the Hon. Treasurer (overdrawn at Lloyd's Bank, Limited).

BERESFORD ADAMS, F. NOEL HUMPHREYS, A.C.A. } HON. AUDITORS.

JOHN SIMON, HON. AUDITOR.

# CURATOR'S REPORT.

The following is a list of the Donors:—

MR. J. ARKLE—92 specimens of *Lepidoptera*, representing 36 species.

MR. J. C. BELTON—2 species of *Lepidoptera*.

MRS. BUCKLER—76 species of Scandinavian and Arctic Plants, with MS. list of same.

MR. W. F. CLARKE—5 specimens of Permian Rocks from section at Skillaw Clough, Lancashire; also specimens from Plas Berw Pits "classed as Permian by Professor Ramsay."

MR. COBBLETON—1 Embryo Nest of *Vespa germanica*.

LIEUT.-COLONEL W. N. CONGREVE, V.C.—103 specimens of British Birds, representing 56 species, chiefly from the Burton Marshes; 1 large Glass Case.

COLONEL B. G. DAVIES-COOKE—15 Geological specimens from Drift Beds at Gwern-y-mynydd.

MR. SIDNEY G. CUMMINGS—1 abnormal Nest of Greenfinch; 2 Nests of Cirl Bunting; 1 Photograph of Nest and Eggs of Montagus Harrier.

THE CURATOR—12 specimens of *Cænonympha davus* var. *philoxenus*, Esp.; 2 specimens of *Sesia culiciformis*; 36 species of *Coleoptera*; 3 Clutches of Sparrow Hawk's Eggs.

MR. J. DICKSON—1 Wren's Nest.

MISS LLOYD FLETCHER—1 Nest of Blue Titmouse; 1 Nest of Door Mouse.

CAPTAIN J. B. FEILDING—1 Atlantic Salmon; 1 Brown Trout; 1 American Brook Trout; 2 Rainbow Trout; 1 Mackinaw Trout.

MR. J. GUY—1 large Minnow.

MRS. MARY A. JONES—1 Buzzard *(Buteo vulgaris)*.

MR. — JONES—Series of Crickets.

MR. A. W. LUCAS—1 Dragon Fly *(Æschna grandis)*.

MR. ALFRED NEWSTEAD—1 Pomatorine Skua *(Stercorarius pomatorhinus)*.

MR. C. OLDHAM—160 specimens of *Mollusca*, representing 17 species; 1 Pochard *(Fuligula ferina)*.

MR. F. L. OKELL—2 Kestrels *(Falco tinnunculus)*.

MR. J. PICKERING—1 Water Rail *(Rallus aquaticus)*.

MISS STEELE PERKINS—260 specimens of *Lepidoptera*, representing 129 species.

MR. F. SIMPSON—3 species Intestinal Worms from Domestic Animals.

MR. WM. SHONE—22 Lantern Slides, representing various Geological formations in the British Isles.

MISS TOMLIN—1 combined Nest of Song Thrush and Blackbird; 3 specimens of *Osmia rufa*.

KINGSLEY MEMORIAL COLLECTION of *Micro-Fungi*, by DR. THEODORE GREEN, contains 148 Microscopical preparations and 170 Herbarium specimens.

TOTAL:—Specimens 792; Species 427.

The list of gifts to the Museum is sufficient to indicate the generous feeling towards the Society's Museum that still prevails. Many of the gifts are both valuable and interesting, and for all of them the Committee have expressed their cordial thanks to the donors. Your Curator would draw special attention to an important addition to the collection of Birds made by LIEUT.-COLONEL W. N. CONGREVE, V.C. It contains three species new to the Society's Collection, viz.:—

Gadwall (*Anas strepera*, Linn.)
Bernacle Goose (*Bernicla leucopsis*, Bechstein)
[*Noddy Tern (*Anous stolidus*, Linn.)]
(*See Coward and Oldham, "Birds of Cheshire," p. 229).

Unfortunately, the specimens are very badly moth-eaten, and otherwise injured by mould, and will need to be cleaned and remounted.

Your Curator would also mention the valuable gifts of *Lepidoptera* by Miss Steele Perkins and Mr. J. Arkle, which includes several species new to the collections.

The gift by Mr. Chas. Oldham, of a series of Fresh-water *Mollusca*, should also be mentioned, as it includes several species hitherto unrepresented in the Museum, and two or three species that were comparatively recently added to the British list.

The Committee wish your Curator to express their thanks to the Director of the Royal Botanic Gardens, Kew, for the verification of the Kingsley Memorial Collection of *Micro-Fungi*, sent in by Dr. Theodore Green. This collection has been added to the Society's Museum.

During the past year Mr. Brockton Tomlin has overhauled, cleaned, and remounted, the small collection of local Shells contained in the Archer Collection. The Committee tender their sincere thanks to Mr. Tomlin for his voluntary help.

R. NEWSTEAD, A.L.S., F.E.S., Hon. F.R.H.S.,
Curator.

April 30th, 1903.

## A FEW BIRD NOTES FOR THE YEAR, By Mr. S. G. Cummings.

Jan. 4th.—Peregrine Falcon, on the Cop opposite Saltney; Bullfinch and Grey Wagtail also seen.

Feb. 12th.—Three Mallards, on the river below the Higher Ferry. Goldfinch, on the Cop, feeding on seeds of the knapweed. A cold frosty day.

Mar. 27th.—Chiffchaff, at Blacon Point. Four days earlier than usual.

,, 31st.—Wheatear, on the Cop.

April 2nd.—Barn Owl, on the wing, in daylight, at Blacon Point.

May 16th.—Adult Cormorant, fishing in the river, near Saltney.

,, 28th.—Common Tern, flying down the river, between Chester and Saltney.

Sept. 4th.—Yellowhammer's Nest, with two young, Bumper's Lane.

,, 13th.—Greenfinch's Nest, with four young, Ferry Lane.

Dec. 25th.—Pair of Goldfinches, on the Sealand Road, close to the town.

A pair of Adult Grey Wagtails, observed at Great Sutton, at the end of September. Not common in Wirral.

The Lesser Whitethroat was exceptionally numerous in West Cheshire; on May 5th I found a nest with five eggs—an early date. This species, as a rule, nests earlier than the Common Whitethroat, in Cheshire.

In June, when in Anglesey, I saw a pair of Red-backed Shrikes, and a nest with young, near Carmel Head. A few days later I saw a male near Point Lynas. This species has not before been recorded for Anglesey, where, however, it is apparently very sparsely distributed.

In July, I discovered a hitherto unknown colony of Cirl Buntings, in the neighbourhood of Colwyn Bay. There were several pairs in evidence, and in two places I found nests; one nest contained eggs, and from another the young had just flown. This interesting bird may be easily overlooked, unless one is familiar with the song and call-note.

On 18th July, a pair of Tree Sparrows crossed the road at Kinmel Park, Denbighshire; a very local bird in North Wales. About Chester it is fairly common and increasing. In September I saw flocks, composed entirely of Tree Sparrows, in the corn fields near Upton.

# Additions to the Society's Library, 1902-1903.

## DONATIONS.

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Chester Society of Natural Science, Reports and Proceedings of the (complete set), 1871-1891. *Mrs. John Mills.*

"The Field," 1902-1903. *Free Library and Mr. A. Rowson.*

Flora of Liverpool District. *The Author (Dr. T. C. Green).*

Infusorian, On Zoothamnium geniculatum, A new. *The Author (Mr. Wm. Ayrton).*

Journal of the Society of Chemical Industry, 1901-2. *Mr. E. G. Ballard.*

Land and Freshwater Shells of the Channel Isles. *The Joint Author (Mr. Brockton Tomlin, M.A.)*

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Plymouth Museum, Fourth Report. *The Curator (Mr. E. Ernest Lowe).*

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# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1902,

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

The results here given are deduced from bi-daily observations of the standard instruments, taken at 9·0 a.m. and 9·0 p.m. local mean time. Returns are sent to the Royal Meteorological Society, the Meteorological Council, the Scottish Meteorological Society, and many private observers in different parts of the Empire.

January.—A very mild month, fully 3·0° above the average, with prevailing westerly winds, and a large number of dull days. A very warm and wet period from the 1st to the 10th, and from the 20th to the 23rd. The 13th and 14th and the last week very cold. Frost on ground on 18 nights, and in Stevenson's screen on 10 nights. Sunshine average. Rainfall quarter-inch short of average. Snow on four days; heavy fall on 26th. Gale from W.S.W. on 20th. Fog on 18th.

February.—A very cold month, fully 5·0° below the average. Snow fell on each of the five days from 7th to the 11th. The ten days from 9th to 18th were especially severe, over 25·0° of Frost in the shade. On the ground the zero point was almost reached on the 12th. The range of temperature during the month was most unusually large. Sunshine very deficient. Rain normal. A very dismal month, 19 days being overcast. Quite a cold douche after the warm January. Hail on 9th. Snow lay from 8th to 22nd.

March.—A warm month, 3·0° above the average. Normal rainfall, but more than the usual number of rainy days. Sunshine rather deficient. Fog on 5th and 6th. Clear weather, with prevailing S.-Westerly winds from 13th to the end of the month. Northerly gales on 25th and 27th. Solar halos on 16th and 17th.

April.—A bright sunny month, with more than the average rainfall, but fewer rainy days. Very warm from the 18th to the 26th. Gales on the 13th and 22nd from the South. Thunderstorm on 23rd. Solar halo on 13th. Hoar-frost on 10th.

May.—A cold, almost unprecedentally wet, dull, cheerless month, with a good deal of east wind; deficient sunshine; 25 days on which rain fell, and the largest amount for any May during the last 27 years with one exception (1898). Gale from the N.W. on 18th, and high winds generally towards the end of the month. Hail and snow shower on 6th. Halo on 14th; and thunderstorms on 17th and 18th, hail accompanying that of the 17th.

June.—Slightly under the average temperature. The maximum shade temperature exceeded 80·0°—and that very slightly—on only four days. Bright sunshine considerably below the average. Rain nearly one inch above it, falling on 18 days. As might be inferred from the prevalence of easterly winds, the number of dull, cheerless days was excessive, 17 being overcast, and only three clear. A thunderstorm on the 29th, and thunder heard (but no lightning seen) on the 30th. Halo on 18th. Very cold weather from 7th to 17th. Solar radiation very intense on 28th and 29th.

July.—A remarkably cold, sunless month, nearly 3·0° below the average temperature, making it in point of heat exactly the same as a normal June. Only two-thirds of the usual amount of bright sunshine. A few warm days from 12th to the 17th, among them the highest shade temperature of the year (85·6° on the 18th). Rainfall about three-quarters-of-an-inch below the average. Gale from N.W. on 10th. Solar radiation very intense on 16th and 17th.

August.—Another cold month, 1¾ degrees below the average. Many sunless days, and a considerable deficiency of bright sunshine. Nearly a quarter-of-an-inch less than the average rainfall, but almost double the

average number of rainy days. A very large number of overcast days made the month most dreary. Prevailing winds from S.W. High N.W. winds in second week. A rather bright, warm, calm, and dry week at the close slightly redeemed the bad character of the month.

SEPTEMBER.—Also below the average temperature three-quarters-of-a-degree. Average in bright sunshine. Deficient in rainfall three-quarters-of-an-inch. First week very warm. Severe gales from W.S.W. on 3rd, and on 16th and 17th from W. Prevailing winds S.-Westerly. Halo on 18th. Heavy dews.

OCTOBER.—2·0° above the average temperature. Only two-thirds of the usual amount of bright sunshine. Rainfall half-an-inch short of average, but number of days on which rain fell excessive; fully one-and-a-quarter-inches falling on the 9th. Gale from N.W. on 16th. Halo on 14th. Frost on the ground on two nights. 14 overcast days. A warm but dismal, dripping month.

NOVEMBER.—1·3° above average temperature, with two very cold days (21st and 22nd). Rainfall one inch short of the average. Sunshine normal. Three frosts in shade (Stevenson screen), and 15 days overcast. Hoar-frost two days.

DECEMBER.—Fully 2·0° above the average temperature. Three-quarters-of-an-inch short in rainfall. A rather dull, warm equable month, with gales from S. and W. on the 14th and 18th, and a very severe gale from W. on 25th. Thunderstorm on the 30th. Hoar-frost and severe cold all through the first week.

As the tables give the meteorological elements for the year 1902 only, it is desirable to add a comparison of the winter and spring months of the present year in brief.

## SHADE TEMPERATURE, AND DIFFERENCE FROM AVERAGE.

| **Winter of 1902-3.** | | **Spring of 1903.** | |
|---|---|---|---|
| December .. .. | 41·1°+1·5° | March .. .. | 46·2°+3·8° |
| January .. .. | 39·9°+1·3° | April .. .. | 44·5°—2·6° |
| February .. .. | 45·9°+6·0° | May .. .. | 52·6°+0·2° |
| Mean .. .. | 42·3°+2·9° | Mean .. .. | 47·8°+0·5° |

THE WINTER MONTHS.—*December* and *January* about 1·5 degrees *above* the average temperature; and *February* fully 6·0 degrees *above* it. The abnormally warm December and January, followed by an unprecedentally warm February, made one of the mildest winters on record.

THE SPRING MONTHS.—*March* 3¾ degrees above the average carried forward the promise of an early spring, and stimulated vegetation to a remarkable extent. *April* fully 2½ degrees colder than the average, with keen frosts, blighting east winds, and sunless days made havoc with bud and blossom. *May* a normal month, but with bitter cold winds kept vegetation back, and made a cold late season, somewhat redeemed by a very fine, warm, sunny week at the close of the month, but too late to save the complete blighting of the early blossoms. March was the wettest March of the past 27 years.

## NOTEWORTHY PHENOMENA OF 1902.

| | |
|---|---|
| Greatest atmospheric pressure ..... | 30·915 in., 31st January |
| Least " " ..... | 28·808 in., 29th December |
| Hottest day in shade ..... ..... | 85·6 degs., 14th July |
| Coldest night in shade ..... ..... | 6·6 degs., 12th February |
| Greatest range of temperature in 24 hours .. | 35·3 degs., 14th July |
| Least " " " .. | 2·1 deg., 26th November |
| Hottest day in sun ..... ..... ..... | 121·5 degs., 29th June |

Coldest night on ground ..... 1·8 degs., 12th February

Greatest excess of open air temperature over shade temperature, 59·1 degs., 1st May.

Greatest difference between lowest temperature in shade and on ground, 17·0 degs., 17th March.

Greatest rainfall on any one day, 1·270 in., 9th October.

Latest early Summer frost, 3·0 degs., 14th May.

Earliest Autumn frost, 1·2 degs., 12th October.

Severe gales, 3rd September and 26th December.

Snow fell on 9 days: 24th—27th January; 7th—11th February.

Thunderstorms in April, May, June, and December; one in each.

Greatest number of consecutive days on which rain fell: 9, 29th April—7th May; 10, 4th—13th August; 11, 12th—22nd October.

Greatest number of consecutive days on which no rain fell: 8, 13th—20th January; 8, 30th January—6th February; 9, 3rd—11th Dec.

Sunniest day of the year, 14·50 hours, on 25th June, being 88 per cent. of the greatest possible amount.

More bright sunshine in the afternoons, averaging nearly half-an-hour on each day of bright sunshine.

Welsh Hills at 9 a.m.—These were only visible on 106 days, a little more than one-fourth of the year; 71 days clearly and 35 very clearly seen.

## EXPLANATIONS.

*Local Mean Time* is used for the regular observations.

*The Barometer* readings, taken at 9-0 a.m. and 9-0 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9-0 a.m., and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9-0 a.m. and placed to previous day.

*Ground Temperatures* read twice daily at 9-0 a.m. and 9-0 p.m. The lowest reading for the 24 hours, prior to 9-0 a.m., is entered to the previous day.

*Underground Temperatures* taken daily at 9-0 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew Point (as determined by Glaisher's Factors), by that corresponding to the temperature of the air (*i.e.* the Dry-bulb reading).

*The Rain* is measured at 9-0 a.m., and the amount entered to the previous day. A fall of 0·006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9-0 a.m. and 9-0 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8·0 an overcast day.

The *wind* direction is taken by means of a Compass Nephoscope, from the drift of the lower clouds.

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Ozone* read at 9-0 a.m. (according to Dr. Moffat's Scale 0—12), and placed to previous day.

*Sunshine Record.*—The photographic traces are fixed *before* being measured.

*Fog, &c.*—The fog, haze, &c., are made from the visibility of objects and lights at definite distances from Rutland Cottage.

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | BRIGHT SUNSHINE. Hours ending Local Apparent Time of each Day of the Month. Forenoon. 5 | 6 | 7 | 8 | 9 | 10 | 11 | Noon |
|---|---|---|---|---|---|---|---|---|
| Jan. ... | | | | | | 1·67 | 6·24 | 9·50 |
| Feb. ... | | | | | ·75 | 6·50 | 9·92 | 10·25 |
| March.. | | | ·08 | 6·50 | 10·00 | 10·75 | 12·76 | 13·84 |
| April... | | | | 14·51 | 17·24 | 20·33 | 19·76 | 20·01 |
| May ... | | 1·08 | 4·00 | 16·92 | 15·80 | 14·82 | 16·23 | 18·07 |
| June ... | | 3·74 | 11·24 | 14·50 | 14·41 | 15·50 | 14·15 | 13·81 |
| July ... | ·42 | 2·59 | 9·17 | 10·66 | 9·25 | 11·25 | 11·50 | 10·49 |
| Aug. ... | | | | 5·52 | 8·01 | 11·45 | 13·16 | 13·84 |
| Sept.... | | | ·08 | 7·41 | 11·09 | 13·49 | 14·24 | 17·68 |
| Oct. ... | | | | ·08 | 3·66 | 7·25 | 8·84 | 8·58 |
| Nov. ... | | | | | ·25 | 4·42 | 6·24 | 9·33 |
| Dec. ... | | | | | | | 3·01 | 6·25 |
| | ·42 | 7·41 | 24·57 | 76·10 | 90·46 | 117·43 | 136·05 | 151·65 |

| Afternoon. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Monthly. Total Hours. | Greatest Possible Percentage. | No. of days without. | Seasons. Hours and Per-centage. | CLOUD (1—10). 9 a.m. | 9 p.m. | Daily Mean. | No. of days Over-cast. | No. of days Clear. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10·91 | 10·23 | 6·33 | | | | | | 44·88 | 18·2 | 11 | Winter 131·47 17·6% | 7·9 | 5·6 | 6·8 | 14 | 3 |
| 10·16 | 8·25 | 6·33 | 2·25 | 1·00 | | | | 55·41 | 20·5 | 14 | | 8·4 | 8·4 | 8·4 | 19 | 1 |
| 17·67 | 13·66 | 11·49 | 10·80 | 10·15 | 3·67 | | | 121·37 | 33·4 | 5 | Spring 498·05 39·5% | 8·1 | 7·1 | 7·6 | 14 | 0 |
| 19·59 | 19·32 | 17·43 | 17·25 | 16·33 | 10·24 | 1·17 | | 193·18 | 46·6 | 3 | | 6·9 | 4·4 | 5·6 | 6 | 1 |
| 16·01 | 19·77 | 18·29 | 16·92 | 12·41 | 8·28 | 4·90 | | 183·50 | 37·7 | 4 | | 8·1 | 8·1 | 8·1 | 16 | — |
| 11·83 | 12·26 | 12·73 | 11·65 | 10·50 | 10·16 | 8·42 | 3·75 | 168·65 | 33·8 | 4 | Summer 446·31 30·8% | 7·5 | 7·0 | 7·3 | 17 | 3 |
| 11·25 | 10·25 | 9·50 | 10·99 | 11·83 | 10·00 | 9·58 | 2·08 | 140·81 | 28·2 | 9 | | 6·5 | 6·6 | 6·5 | 9 | 2 |
| 15·94 | 14·39 | 13·11 | 13·22 | 13·65 | 9·47 | 5·09 | | 136·85 | 30·4 | 5 | | 8·3 | 6·1 | 7·2 | 13 | — |
| 17·83 | 16·08 | 13·08 | 13·33 | 8·90 | 4·16 | | | 137·37 | 36·7 | 6 | Autumn 245·88 25·9% | 7·2 | 5·4 | 6·2 | 7 | 3 |
| 10·40 | 7·32 | 5·67 | 4·91 | 3·08 | ·58 | | | 60·37 | 18·7 | 12 | | 8·2 | 8·0 | 8·1 | 14 | — |
| 10·08 | 9·83 | 6·58 | 1·41 | | | | | 48·14 | 19·0 | 14 | | 7·5 | 6·6 | 7·1 | 15 | 3 |
| 10·34 | 8·75 | 2·83 | | | | | | 31.18 | 13·7 | 16 | | 7·1 | 7·6 | 7·4 | 13 | 2 |
| 162·01 | 150·11 | 123·37 | 102·73 | 87·85 | 56·56 | 29·16 | 5·83 | 1321·71 | 29·7 | 103 | | 7·5 | 6·8 | 7·2 | 157 | 18 |

During Forenoon 604·09. During Afternoon 717·62.

# METEOROLOGICAL OBSERVATIONS

## RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N.; Long. 11m. 36s. W.

MONTHLY SUMMARY OF

| | JAN. | FEB. | MARCH. | APRIL. |
|---|---|---|---|---|
| PRESSURE (reduced to 32° F., and mean sea level)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 30·133in. | 29·803in. | 29·815in. | 29·925in. |
| Highest reading | 30·915in. | 30·849in. | 30·217in. | 30·377in. |
| ,, ,, Date of | 31 | 1 | 16 | 7 |
| Lowest ,, | 29·024in. | 29·207in. | 28·959in. | 29·324in. |
| ,, ,, Date of | 1 | 27 | 24 | 22 |
| Range | 1·891in. | 1·642in. | 1·258in. | 1·053in. |
| TEMPERATURE in shade (Stevenson's screen)— | | | | |
| Approximate mean | 41·9° | 34·7° | 45·4° | 45·8° |
| Arithmetical mean | 41·8° | 34·7° | 45·6° | 46·2° |
| Climatological ,, | 41·8° | 33·9° | 45·7° | 46·4° |
| Dry bulb (9 a.m. and p.m.) mean | 41·3° | 34·4° | 45·2° | 46·6° |
| Mean maximum | 46·6° | 40·8° | 52·2° | 55·4° |
| Mean minimum | 36·9° | 28·6° | 39·0° | 37·1° |
| Extreme maximum | 56·0° | 56·4° | 59·6° | 64·1° |
| ,, ,, Date of | 3 | 28 | 17 | 25 |
| ,, minimum | 22·7° | 6·6° | 30·8° | 27·8° |
| ,, ,, Date of | 14 | 12 | 6 | 7 |
| ,, range | 33·3° | 49·8° | 28·8° | 36·3° |
| Mean daily range | 9·7° | 12·2° | 13·2° | 18·3° |
| Maximum daily range | 15·5° | 33·2° | 22·2° | 27·6° |
| ,, ,, Date of | 31 | 12 | 6 | 25 |
| Minimum ,, | 3·6° | 3·3° | 6·8° | 8·1° |
| ,, ,, Date of | 6 | 3 | 14 | 22 |
| Number of nights at or below 32° | 10 | 16 | 3 | 5 |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 59·5° | 62·6° | 85·4° | 95·6° |
| Extreme maximum | 78·1° | 90·5° | 102·5° | 106·1° |
| ,, ,, Date of | 24 | 28 | 27 | 13 |
| Greatest excess over shade maximum | 35·9° | 59·0° | 47·7° | 51·6° |
| ,, ,, ,, ,, Date of | 25 | 11 | 21 | 2 |
| Average ,, ,, ,, | 8·5° | 21·8° | 33·2° | 40·2° |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 30·6° | 25·2° | 33·0° | 31·7° |
| Extreme minimum | 19·1° | 1·8° | 25·8° | 21·5° |
| ,, ,, Date of | 14 | 12 | 24 | 11 |
| Greatest difference from shade minimum | 15·3° | 11·9° | 17·0° | 10·0° |
| ,, ,, ,, ,, Date of | 4 | 9 | 17 | 30 |
| Mean ,, ,, ,, | 6·3° | 3·4° | 6·0° | 5·4° |
| Number of nights at or below 32° | 18 | 20 | 15 | 16 |
| TEMPERATURE underground— | | | | |
| Mean at 1 foot | 40·5° | 37·1° | 43·4° | 45·7° |
| Range ,, | 6·7° | 6·7° | 5·1° | 7·8° |
| Mean at 2 feet | 41·9° | 37·7° | 43·4° | 45·8° |
| Range ,, | 4·2° | 4·1° | 4·3° | 4·8° |
| Mean at 3 feet | 42·8° | 39·4° | 43·1° | 45·4° |
| Range ,, | 2·2° | 3·4° | 4·1° | 3·2° |
| Mean at 4 feet | 43·6° | 40·8° | 43·2° | 45·3° |
| Range ,, | 1·6° | 3·3° | 3·8° | 2·4° |
| Air temperature, 9 a.m. | 41·9° | 34·0° | 46·6° | 49·1° |
| Range of ,, ,, | 27·0° | 33·7° | 14·5° | 21·3° |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 1·785 | 1·720 | 1·585 | 1·985 |
| ,, ,, since 1st January | | 3·505 | 5·090 | 7·075 |
| Maximum fall in 24 hours | ·420 | ·370 | ·410 | ·370 |
| ,, ,, Date of | 26 | 8 | 24 | 4 |
| Number of days 0·01 fell | 17 | 13 | 18 | 13 |
| ,, ,, since 1st January | | 30 | 48 | 61 |
| Mean relative humidity, 9 a.m. | 90 | 87 | 78 | 73 |
| ,, ,, 9 p.m. | 89 | 93 | 88 | 83 |
| ,, ,, of both | 90 | 90 | 83 | 78 |
| Mean vapour pressure, 9 a.m. | ·237 | ·172 | ·245 | ·258 |
| ,, ,, 9 p.m. | ·225 | ·188 | ·253 | ·247 |
| ,, ,, of both | ·231 | ·180 | ·249 | ·250 |
| Mean dew point, 9 a.m. | 38·8° | 30·7° | 39·7° | 41·0° |
| ,, 9 p.m. | 37·7° | 33·0° | 40·5° | 39·2° |
| ,, ,, of both | 38·3° | 31·8° | 40·1° | 40·1° |

# OF THE YEAR 1902.

ROAD, CHESTER.

ATMOSPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| MAY. | JUNE. | JULY. | AUGUST. | SEPT. | OCT. | NOV. | DEC. | YEARLY SUMMARY. |
|---|---|---|---|---|---|---|---|---|
| 30·001in. | 29·958in. | 30·041in | 29·936in. | 30·085in. | 30·002in. | 29·870in. | 30·057in. | 29·969in. |
| 30·515in. | 30·273in. | 30·313in. | 30·180in. | 30 522in. | 30·486in. | 30·400in. | 30·657in | 30·915in. |
| 25 | 23 | 11 | 21 | 26 | 24 | 17 | 4 | 31 Jan. |
| 29·255in. | 29·478in. | 29·410in. | 29·574in. | 29·344in. | 29·254in. | 29·045in. | 29·808in | 29·808in. |
| 17 | 7 | 26 | 18 | 3 | 15 | 28 | 29 | 29 Dec. |
| 1·260in. | ·795in. | ·903in. | ·607in. | 1·178in. | 1·232in | 1·355in. | 1·849in. | 2·107in. |
| 48·9° | 57·1° | 58·1° | 58·3° | 55·6° | 50·4° | 45·5° | 41·3° | 48·6° |
| 49·3° | 57·7° | 58·7° | 58·8° | 56·1° | 50·6° | 45·5° | 41·4° | 48·9° |
| 49·2° | 57·9° | 58·7° | 59·1° | 56·2° | 50·8° | 45·4° | 40·6° | 48·8° |
| 48·7° | 58·5° | 59·8° | 57·1° | 54·9° | 49·9° | 44·8° | 41·0° | 48 7° |
| 56·5° | 66·6° | 68·1° | 66·9° | 64·9° | 56 9° | 50·3° | 45·5° | 55·9° |
| 42·2° | 48·9° | 49·4° | 50·7° | 47·2° | 44·3° | 40·6° | 36·7° | 41·8° |
| 65·6° | 83·3° | 85·6° | 72·6° | 74·0° | 62·8° | 60.7° | 57 6° | 85·6° |
| 27 | 28 & 29 | 14 | 16 & 23 | 8 | 23 | 1 | 14 | 14 July |
| 32·2° | 37·4° | 40·0° | 45·3° | 36·4° | 34·5° | 28·7° | 17·0° | 6·6° |
| 9 | 9 | 24 & 25 | 9 & 26 | 13 | 4 | 21 | 7 | 12 Feb. |
| 33·4° | 46·4° | 45·6° | 27 3° | 37·6° | 28 3° | 32·0° | 40·6° | 79·0° |
| 14·3° | 17·7° | 18·7° | 16·2° | 17·7° | 12 6° | 9·7° | 8·8° | 14·1° |
| 22·8° | 33·7° | 35·3° | 24·9° | 31·4° | 22·1° | 21 0° | 16·2° | 35·3° |
| 11 | 28 | 14 | 26 | 25 | 4 | 2 | 15 | 14 July |
| 5·3° | 7·6° | 5·4° | 5·9° | 4·0° | 5·3° | 2·1° | 3·4° | 2·1° |
| 30 | 20 | 9 | 24 | 11 | 6 | 26 | 11 | 26 Nov. |
| — | — | — | — | — | — | 3 | 10 | 47 |
| 98·5° | 105·9° | 109·4° | 102·3° | 94·2° | 78·3° | 62·6° | 52·5° | 83·9° |
| 14·2° | 121·5° | 121·2° | 115·5° | 115·0° | 95·1° | 87·6° | 73·7° | 121·5° |
| 27 | 29 | 17 | 23 | 3 | 27 | 1 | 2 | 29 June |
| 59 1° | 51·2° | 48·4° | 42·8° | 44·6° | 37·1° | 30·8° | 23·1° | 59·1° |
| 1 | 10 | 16 | 10 & 24 | 3 & 13 | 27 | 7 | 2 | 1 May |
| 42·0° | 39·3° | 41·3° | 35·4° | 20·5° | 21·4° | 12·3° | 7·0° | 27·7° |
| 30·2° | 46·3° | 47·7° | 48·3° | 43·7° | 40·0° | 35·5° | 33·4° | 37·1° |
| 26·9° | 33·2° | 39·9° | 42·3° | 36·4° | 30·8° | 20·0° | 12·0° | 1·8° |
| 9 | 10 | 2 | 9 | 13 | 12 | 19 | 7 | 12 Feb. |
| 9·8° | 7·6° | 10·0° | 5·6° | 5·3° | 9·5° | 14·6° | 8·5° | 17·0° |
| 13 | 3 | 23 | 8 | 30 | 17 | 10 | 3 | 17 March |
| 12·0° | 2·6 | 1·7° | 2·4° | 3 5° | 4·3° | 5·1° | 3·3° | 4·7° |
| 8 | — | — | — | — | 2 | 9 | 12 | 100 |
| 50·4° | 56·3° | 60·8° | 58·4° | 56·5° | 50·8° | 46·3° | 41·6° | 49 0° |
| 7·6° | 14·4° | 6·2° | 4·4° | 6·7° | 4·5° | 10 0° | 8·4° | 7·4° |
| 49·8° | 54·5° | 59·2° | 57·6° | 56·9° | 51·8° | 47·9° | 43·2° | 49 1° |
| 5·0° | 8·3° | 3·3° | 2·2° | 4·9° | 4·2° | 7·0° | 5·2° | 4·8° |
| 48·8° | 53·2° | 57·3° | 56·7° | 56·5° | 52·5° | 49·1° | 44·5° | 49·1° |
| 3·8° | 5·5° | 2·1° | 1·1° | 2·9° | 3·4° | 5·1° | 4·2° | 3·4° |
| 48·3° | 51·8° | 56·0° | 55·9° | 56·1° | 52·8° | 49 9° | 45·6° | 49·1° |
| 3·1° | 4·4° | 1·8° | 0·8° | 2·0° | 3·0° | 4·1° | 3·5° | 2·8° |
| 51·2° | 60·9° | 61·5° | 59·2° | 56·3° | 51·2° | 44·7° | 40·2° | 49·7° |
| 22·9° | 28·3° | 18·8° | 10·3° | 15·6° | 14·1° | 21·1° | 36·0° | 22·0° |
| 4·260 | 1·490 | 2·185 | 2·805 | 1·165 | 3·585 | 1·470 | 1·845 | |
| 11·335 | 12·825 | 15·010 | 17·815 | 18·980 | 22·565 | 24·035 | 25·880 | 25·880 |
| ·935 | ·165 | ·850 | ·500 | ·450 | 1·270 | ·440 | ·480 | 1·270 |
| 17 | 16 & 19 | 24 | 7 | 10 | 9 | 28 | 14 | 9 Oct. |
| 25 | 16 | 16 | 20 | 15 | 21 | 16 | 15 | |
| 86 | 102 | 118 | 138 | 153 | 174 | 190 | 205 | 205 |
| 78 | 77 | 77 | 83 | 81 | 88 | 88 | 90 | 83 |
| 90 | 87 | 84 | 88 | 89 | 91 | 89 | 89 | 88 |
| 84 | 82 | 81 | 86 | 85 | 90 | 88 | 90 | 86 |
| ·295 | ·409 | ·419 | ·414 | ·371 | ·330 | ·259 | ·224 | ·303 |
| ·278 | ·391 | ·409 | ·385 | ·363 | ·320 | ·264 | ·232 | 296 |
| ·286 | ·400 | ·414 | ·400 | ·367 | ·325 | ·261 | ·228 | ·299 |
| 44·5° | 53·5° | 54·1° | 53·7° | 50·7° | 47·5° | 41·2° | 37·5° | 44·4° |
| 43·0° | 52·1° | 53·3° | 51·8° | 50·0° | 50·8° | 41·8° | 38·4° | 44·3° |
| 43·7° | 52·8° | 53·7° | 52·8° | 50·3° | 49·2° | 41·5° | 38·0° | 44·4° |

## WIND AND OZONE.

| | Force. | | | | | Direction to 8 Points of the Compass. | | | | | | | | | Ozone. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 9 p.m. | Mean. | Maximum. | Date of | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. | Mean Amount. | Maximum. |
| January ... | 1·8 | 1·4 | 1·6 | 7 | 20 | W | — | — | 2 | — | 2 | 7 | 22 | 11 | 18 | 2·4 | 7 |
| February | 1·0 | 1·2 | 1·1 | 5 | 26 | SE | — | 3 | 2 | 15 | 10 | 1 | 2 | 6 | 17 | ·4 | 5 |
| March ... | 2·2 | 1·2 | 1·7 | 7 | 25 & 27 | W | — | — | — | 4 | 4 | 10 | 18 | 13 | 13 | 3·1 | 7 |
| April ... | 2·2 | 1·5 | 1·8 | 7 | 13 & 22 | SE | 5 | 2 | 8 | 9 | 5 | 5 | 3 | 9 | 14 | 3·1 | 7 |
| May ... | 2·2 | 1·2 | 1·7 | 7 | 18 | NW | 3 | 9 | — | — | 1 | 4 | 10 | 17 | 18 | | |
| June ... | 1·6 | 1·1 | 1·4 | 5 | 13 | SE | 5 | 2 | 1 | 18 | 4 | 5 | 5 | 5 | 15 | | |
| July ... | 3·2 | 1·9 | 2·5 | 7 | 10 | NW | 4 | 1 | — | — | — | 8 | 14 | 21 | 14 | | |
| August ... | 2·3 | ·7 | 1·5 | 6 | 9 & 10 | NW | 2 | — | — | 5 | 5 | 5 | 8 | 13 | 24 | | |
| September | 2·4 | ·9 | 1 7 | 8 | 3 | W | — | 1 | 2 | 4 | 7 | 4 | 8 | 9 | 25 | | |
| October .. | 1·9 | 1 2 | 1·5 | 7 | 16 | NW | — | 1 | 7 | 4 | 1 | 6 | 8 | 10 | 25 | | |
| November | 1·8 | 1·3 | 1·6 | 6 | 9 | SE | 1 | — | 8 | 21 | 5 | 6 | 3 | 2 | 14 | | |
| December | 1·8 | 2·0 | 1·9 | 9 | 25 | W | 2 | — | 5 | 3 | 5 | 4 | 20 | 5 | 18 | | |
| Totals ... | 2·0 | 1·3 | 1·7 | 9 | 25th Dec. | W | 22 | 19 | 35 | 83 | 49 | 65 | 121 | 121 | 215 | | |
| Percentages | | | | | | | 3·0 | 2·6 | 4 8 | 11·3 | 6·7 | 9·0 | 16·6 | 16·6 | 29·4 | | |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | At 9 A.M. or 9 P.M. or both. | | | | | At any Hour. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dew. | Hoar Frost. | Wels Hills. 9 a.m. Invisible | Visib e. Clearly | Very clearly | Thunder Storm. | Lightning only. | Thunder only. | Halo. | Cales. | Aurora. | Snow | Hail. | Fog. |
| January ... | 10 | 11 | 22 | 6 | 3 | — | — | — | 1 | 1 | — | 4 | — | 1 |
| February ... | 1 | 9 | 27 | 1 | — | — | — | — | 2 | — | — | 5 | 1 | 1 |
| March ... ... | 8 | — | 12 | 12 | 7 | — | — | — | 2 | 2 | — | — | — | 2 |
| April ... ... | 10 | 1 | 23 | 6 | 1 | 1 | — | — | 1 | 2 | — | — | — | — |
| May ... ... | 5 | — | 18 | 6 | 7 | 1 | — | — | 1 | 1 | — | 1 | 1 | — |
| June ... ... | 2 | — | 27 | 1 | 2 | 1 | — | 1 | 1 | — | — | — | — | — |
| July ... ... | 10 | — | 15 | 11 | 5 | — | — | — | — | 1 | — | — | — | — |
| August ... | 11 | — | 20 | 10 | 1 | — | — | — | 1 | 1 | — | — | — | — |
| September ... | 14 | — | 21 | 4 | 5 | — | — | — | 1 | 3 | — | — | — | 2 |
| October ... | 10 | — | 24 | 5 | 2 | — | — | — | 1 | 1 | — | — | — | — |
| November ... | 7 | 3 | 27 | 2 | 1 | — | — | — | — | — | — | — | — | 1 |
| December ... | — | 9 | 23 | 7 | 1 | 1 | — | — | — | 3 | — | — | — | — |
| Total ... | 88 | 33 | 259 | 71 | 35 | 4 | — | 1 | 11 | 15 | — | 10 | 2 | 7 |

# KINGSLEY MEMORIAL PRIZES

ARE OFFERED UNDER THE FOLLOWING CONDITIONS:—

## CLASS I.

**To any Resident in the Society's District.**—A Prize not exceeding Ten Pounds for the best Collection of Objects, or Essays, or Notes of Observations, or Photographs illustrating the Natural Science of the Society's District.

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the Competitors.

Collections, or Essays, or Notes, must be sent to the General Secretaries on or before September 1st, and the awards will be made at the Conversazione next succeeding.

The Committee have the option of retaining successful Collections, &c., for the Society.

## CLASS II.

**In order to encourage the study of Natural History among younger Students, not exceeding 17 years of age, and residing in the Society's District, *i.e.*, Cheshire and North Wales, the following Prizes of One Guinea each are offered, viz.:—**

1.—For the best account of the Life-History and Habits of the Common House Sparrow;

2.—For the best Collection of dried and mounted specimens of British Grasses;

3.—For the best Essay descriptive of the Physical Geography and Natural Features of the district in which the competitor resides;

4.—For the best Descriptive List of Insects which are Injurious to Plants in the district in which the competitor resides. As far as practicable the list should be accompanied by actual specimens of the Insects referred to.

NOTE.—The Collections must be made, and the Lists and Essays written, entirely by the Competitors, and each must be accompanied by the name and exact age of the Competitor, and sent to the General Secretaries on or before September 1st.

The Committee do not bind themselves to give the full prize in case of insufficient merit.

Any further information required can be had on application to the Hon. Secretaries.

## "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Account for the Year ended 30th April, 1903. **Cr.**

| 1902-1903. | £ | s. | d. | 1902-1903. | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| To Balance from last Account | 7 | 19 | 5 | By Prizes awarded as follows:— | | | |
| „ Dividends on Great Western Railway Company Consolidated Ordinary Stock | 15 | 2 | 7 | Dr. C. Theodore Green, F.L.S. ..... .. | 10 | 0 | 0 |
| „ Bank Interest..... | 0 | 1 | 6 | Miss G. M. Siddall..... | 2 | 2 | 0 |
| | | | | Engraving Kingsley Memorial Medal..... | 0 | 2 | 6 |
| | | | | Balance ..... | 10 | 19 | 0 |
| | £23 | 3 | 6 | | £23 | 3 | 6 |
| To Balance in Bank .....£10 19 0 | | | | | | | |

*April 30th*, 1903.—Examined and found correct,

GEORGE P. MILN, HON. TREASURER. J. LYON DENSON, AUDITOR.

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1892-3 His Grace The Duke of Westminster, K.G.
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1895 ,, 1897—Henry Stolterfoth, Esq., M.A., M.D., J.P.
1897-8 Thomas Shepheard, Esq., F.R.M.S.
1898 to 1902—John D. Siddall, Esq.

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### WITH WHICH THE SOCIETY EXCHANGES PUBLICATIONS.

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Bristol Naturalists' Society.
British Association (Corresponding Society's Committee).
British Museum (Natural History), Cromwell Road, London, S.W.
Burnley Literary and Scientific Club.
Cardiff Naturalists' Society.
Cassel Society of Natural Science.
Dudley and Midland Geological and Scientific Society and Field Club.
Epping Forest and County of Essex Naturalists' Field Club.
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The Missouri Botanical Garden, St. Louis, U.S.A.
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Vienna Natural History Museum.
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# KINGSLEY MEMORIAL MEDAL

ESTABLISHED 1877,

*"For having contributed materially to the promotion and advancement of some branch or department of Natural Science."—Vide* Trust Deed.

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# KINGSLEY MEMORIAL PRIZES,

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ESTABLISHED 1877,

*"For the reward, encouragement, and the advancement of the pursuit and study of Natural Science."—Vide* Trust Deed.

| | | |
|---|---|---|
| 1878 | HELEN SMITH .....£5<br>EDWIN W. OKELL .... 5 | *Herbarium of Flowering Plants.* |
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| 1882 | GEORGE SHRUBSOLE .. 10 | *Corals of the Mountain Limestone.* |
| 1886 | ROBERT NEWSTEAD .. 10 | *Hymenoptera.* |
| 1887 | JOHN LYON DENSON .. 5 | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888 | LILIAN E. TOMLIN .. 5 | *Coleoptera.* |
| 1889 | EDITH C. TOMLIN .... 5<br>W. E. SHARP ..... 5 | *Diptera and Hymenoptera (Terebrantia)*<br>*Coleoptera.* |
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| 1902 | C. THEODORE GREEN £10 | *Collection of 148 Microscopical Preparations and 170 Herbarium Specimens of Micro-Fungi, together with a descriptive Catalogue and Essay upon same.* |

Amounts less than £5 are also awarded annually.

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☞ **THE ANNUAL SUBSCRIPTIONS are due on the 1st of May in each year. Members who have not paid for the present year are respectfully requested to forward the amount (Five Shillings) to the Hon. Treasurer, Mr. JOHN SIMON, Chemist, 4, Eastgate Row.**

*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their Names are retained on the Society's Books, and their Subscriptions considered due, until notice has been given to the contrary, according to Rule* 8.

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Booley, Miss .....11 Lorne street
Bourne, Mr. Harold ..... } c/o Miss Golder, 6 St. John's Road, Queen's Park
Bowers, Mr. J. H. .....Hawthorne villa, Hoole road
Bowers, Mrs. ..... ,, ,,
Bowles, Mrs. T. S. .....The Limes, Liverpool road
Bowles, Miss Agnes Millicent.... ,, ,,
Bowley, Miss Gladys .....Newgate Street House
Boyer, Miss Edith .....2 Paradise row
Bradbury, Mr. R. P.....Walmore, Dee banks
Bramall, Mr. G. H. .....4 Nicholas street
Brassey, Miss .....Rose hill, Bowdon, Cheshire
Brassey, Mr. Herbert .....The Limes, Curzon park
Brassey, Mrs. ..... ,, ,,

Brewer. Miss E. ..... 15 Paradise row
Brewer, Miss Anne ..... ,, ,,
Bridge, Dr. J. C., M.A. ..... Christ Church Vicarage
Bridge, Mrs. ..... ,, ,,
Bridge, Miss ..... ,, ,,
*Broadbent, Mrs. ..... Bache Cottage
Brock, Mr. Frank ..... Eaton gardens, Chester
Brown, Miss L. E. ..... The Folly, Flookersbrook
*Brown, Mr. F. F., M.A. ..... Eastgate row
Brown, Miss ..... 61 Bouverie street
Brown, Miss Daisy ..... ,, ,,
Brown, Mr. W. E. ..... 33 Parkgate road
Brown, Mrs. ..... ,, ,,
Brown, Mr. W. Ernest ..... ,, ,,
Brown, Mrs. H. T. ..... Westminster avenue, Hough Green
Buchan, Mr. Alex., F.I.C. ..... 19 Eastgate row
Buckland, Miss ..... 31 Nicholas street
Bullin, Mr. F., L.D.S., R.C.S., J.P. ... 20 Nicholas street
Bullin, Mrs. ..... ,, ,,
Bullin, Miss E. ..... ,, ,,
Bull, Mr. H. F. ..... 4 Sunny Bank, Queen's park
Bull, Mrs. ..... ,, ,,
Burrows, Mr. R. ..... Railway Inn, Brook street
Burness, Mr. Wm. ..... Parr's Bank, Ltd., Chester
Butcher, Mr. Jas. ..... 19 Seller street
Butterworth, Mr. Robt. ..... 35 Bouverie street

Caldecott, Mr. C. D. ..... King street, Wrexham
Caldecott, Miss C. G. ..... 19 Pepper street
Campbell, Mrs. Pitcairn ..... Vicar's Cross, Chester
Campbell, Mr. A. D. Pitcairn .... ,, ,,
Carr, The Hon. Mrs. ..... 14 Hough green
Carr, Mrs. Thos. ..... Fuller's Moor, Broxton
Carter, Mr. T. ..... Chemist, Boughton
Catherall, Mr. Samuel ..... 1 Linenhall street
Cestria, Miss Louise ..... Sealand Cottage, Chester
Challinor, Mr. R. ..... 34 Eaton road
Chalton, Mr. T. W. ..... Wynstay, Hoole, Chester
Chalton, Mrs. ..... ,, ,,
Chapman, Mr. F. W. ..... 46 Tarvin road
Chapman, Mrs. ..... ,, ,,
Chapman, Mr. M. D. ..... 59 Tarvin road
*Chester, The Right Rev. The Lord Bishop of ..... } The Palace, Dee side
Chidley, Mr. T. ..... 14 St. Werburgh street
Churton, Mrs. G. ..... 96 Watergate flags
Clark, Mr. Sidney ..... Upton Villa
Clark, Miss Sybil ..... Stanley house
Clark, Miss ..... 19 Grosvenor street
Clark, Miss Eva ..... ,, ,,
Clarke, Mr. John ..... Pasadena, Liverpool road
Clarke, Mr. W. J. ..... The Beeches, Upton park
Clarke, Mr. Ernest ..... ,, ,,
Clare, Mr. Horatio ..... Grosvenor Schools, Chester
Clay, Miss Beatrice E. ..... The Queen's School
Clayton-East, Mr. G. F. L. ..... Bache Hall Lodge
Clemence, Mr. S. ..... 2 Chichester street
Clemence, Mr. Thos. ..... Hough green
Clough, Mr. G. F. ..... 78 Hough green
Cochrane, Mr. J. G. ..... 9 Grange road, Brook lane
Cockrill, Mr. C. P. ..... Briercliffe, Hough green
Cockrill, Mrs. ..... ,, ,,

Coe, Mr. D. .....Howard lodge, Hamilton street
Coe, Mr. Henry J. ..... 18 Queen's avenue
Cohen, Mr. Eustace G. .....11 Stanley place
Collinge, Mr. James .....Kinnerton Lodge, Chester
Coltart, Mr. C. B. .....23 Hough green
Connah, Mr. Jas. ..... { Government Laboratory, Clement's Inn Passage, London, W.C.
Conway, Mr. Walter .....8 and 10 Old Bank buildings
Cook, Mr. G. Mark .....110 Foregate street
Cook, Mr. R. .....7 The Groves
Cook, Miss Alice M. ..... " "
Cooke, Mr. J. H. .....6 Queen street
Coppack, Mr. Chas. .....Gladwyn, Liverpool road
Coppack, Miss ..... " "
Coppack, Miss Nellie ..... " "
Cordery, Miss C. .....St. Agnes' School, Caldy, West Kirby
Crane, Mr. H. E. .....Savings Bank House, Grosvenor street
Crimes, Mr. W. H. .. .....167 Boughton
Cullimore, Mrs. .....Christleton, Chester
Cullen, Mr. W. H. .....Weston Point, Queen's park
Cummings, Miss A. F. .....6 King's buildings
*Cummings, Mr. Sidney G. ..... " "

*Darby, Very Rev. J. L., D.D. ..The Deanery
Darby, Mrs. ..... "
Darby, Miss ..... "
Darby, Mr. Alfred .....Ashgrove, Grosvenor road, Wrexham
Davies, Miss Henrietta .....69 Boughton
Davies, Mr. E. Henry .....19 Francis street
Davies, Mr. Joseph ..... " "
Davies, Mr. John .....Parr's Bank, Limited, Chester
Davies, Mr. W. L. ..... .....Beechwood House, Canal street
Davies, Mrs. ..... " " "
Davies, Rev. J. T., M.A. .....6 Abbey green
Davison, Mr. J. .....60 Liverpool road
Davison, Mrs. ..... " "
Day, Mr. John ..... .....Bryntirion, Chichester street
Day, Mrs. ..... " " "
Day, Miss ..... " " "
Day, Mr. George ..... .....Eastgate street
Delany, Mr. John ..... .....7 Lorne street (South)
Delany, Mrs. ..... " "
Dennis, Miss Ada .....47 Nicholas street
Denson, Mr. W. ..... ...21 Upper Northgate street
Denson, Mrs. ..... " "
Denson, Miss Adelaide ..... " "
Denson, Mr. J. Lyon ..... " "
Denson, Mr. W. H. ..... .....Westminster avenue, Hough green
Denson, Mrs. ..... " "
Dickinson, Mr. D. .....1 Upton view, Hoole
Dickinson, Mrs. ..... " "
Dickson Mr. Francis C. .....8 Waterloo road
Dickson, Mrs. T. Campbell ..... " "
Dickson, Mr. Geo. A., J. P. ....Springfield, Flookersbrook
Dickson, Mr. J. H. .....St. Ives, Queen's park
Dickson, Mrs. ..... " "
Digby, Miss .....2 Grey friars
Digweed, Mr. Chas. S. .....2 Panton road, Hoole
*Dobie, Dr. W. M., F.R.A.S.. J.P. .4 Hunter street
*Dobie, Mr. W. H., M.B. .....2 Hunter street
Dobie, Mrs. ..... "

*Dobie, Dr. Herbert .....11 St. John street
Dobie, Mrs. ..... ,, ,,
Dobie, Mr. Douglas .....12 Upper Northgate street
Dobson, Mr. R.....39 Cotgreave terrace
Dod, Rev. C. Wolley, M.A., J.P...Edge Hall, Malpas
Dod, Miss Wolley ..... ,, ,,
Dodd, Mr. W. .....Mayfield Cottage, 7 Vicarage road, Hoole
Dodd, Mr. Henry ..... ,, ,, ,,
Dodd, Mr. John .....35 Saughall road
Donald, Mrs. .....The Cross
Douglas, Mr. C. P. .....St. Martin's House
Douglas, Mrs. ..... ,, ,,
Dowdall, Colonel A. P. .....25 Curzon park
Dowdall, Miss A. ..... ,, ,,
Drinkwater, Dr.....Wrexham
Ducker, Mr. P. J. .....George street
Duckworth, Mr. Henry, F.L.S., F.G.S...7 Grey friars
Duff, Dr.....5 Abbey street
Duke, Col. A. W., R.A.M.C.....Montrose house, Hough green
Dutton, Mrs. .....Curzon house
Dutton, Mrs. G. W. .....Claremont, Vicar's Cross, Chester
Dutton, Mr. H. B. .....Freshfield, 27 Curzon park
Dutton, Mrs. ..... ,, ,,
Dutton, Mr. Stanley Gordon .... ,, ,,
Dutton, Miss M. .....11 Grosvenor road
Dutton, Mr. J. Rowe .....16 Hough green
Dutton, Mr. A. E. .....55 Frodsham street
Dye, Mr. Alfred B. .....Fairhazel, 30 Bouverie street
Dye, Miss Ethel ..... ,, ,,

Edwards, Mr. Charles .....Dodleston, near Chester
*Edwards, Mr. F. G., F.R.C.V.S.. 5 Newgate street
Edwards, Rev. Frank, M.A. ....St. Paul's Vicarage
Edwards, Mrs. ..... ,, ,,
Edwards, Miss .....28 Queen street
Edwards, Mrs. .....59 Tarvin road
Eddy, Miss E. .....29 Bouverie street
Eggers, Miss .....42 Hough green
Egginton, Mr. R. H. ..... .32 St. Martin's fields
Egginton, Mrs. ..... ,, ,,
Elliott, Dr. John, B.S., B.Sc.....24 Nicholas street
Elliott, Mrs. ..... ,, ,,
Ellis, Mr. R. J. .....6c Foregate street
Evans-Lloyd, Col., J.P. .....Stanley house
*Evans, Mr. F. .....The Eastgate
Evans, Mr. Geo. H. .....The Limes, Lumley road
Evans, Miss ..... Roseneath, Wrexham
Evans, Mrs. .....54 Watergate street
Evans, Miss E. M. ..... ,, ,,
Evans, Miss Charlotte ..... ,, ,,
Ewing, Mr. C. A. .....Rockcliffe, Queen's park
Ewing, Miss Alice Mabel ..... ,, ,,
Ewing, Mr. Ch. G. ..... ,, ,,
Ewing, Master J. Cecil R. ..... ,, ,,

Farmer, Mr. Richard .....56 Liverpool road
Farrimond, Mr. F. T. .....Sunnyside, Boughton
Fergusson, Mr. W. .....The Cairn, Liverpool road
Fergusson, Miss J. M. ..... ,, ,,
Ffoulkes, Mr. Thomas B., Junr...8 Burlington road, Ipswich
Ffoulkes, Mr. Geo. B. .....15 Chichester street

Ffoulkes, Miss Jocelyn .....Kingsley lodge, Liverpool road
Ffoulkes, Miss H. Jocelyn ..... ,, ,,
Finchett-Maddock, Mrs. H. ....Cae Gwyn, Carnarvon
Fish, Mrs. .....Arnold house, Parkgate road
*Fish, Rev. A. H., B.A., B.Sc. .. ,, ,,
Fish, Mr. Cecil E., B.A., M.B., B.C. (Camb.), M.R.C.S., L.R.C.P. (Lon.) } Llanbedr Hall, Ruthin, N. Wales
Fitz-Gerald, Dr. W. A. .....25 Liverpool road
Fleming, Mr. T. R. .....Rowton Grange
Fleming, Mrs..... ,, ,,
Fletcher, Miss .....Woodbrae, Curzon park
Float, Mrs. S. M. .....20 Upper Northgate street
Fluitt, Miss.....25 Upper Northgate street
Ford, Rev. R. Anson .....34 Upper Northgate street
Forster, Mr. W. Angus .....Belgrave lodge, Pulford
Franks, Miss .....11 City Walls (South)
Fraser, Mr. R. .....Greenbank, Eaton road
Fraser, Miss ..... ,, ,,
Frater, Mr. Geo. .....Grey Holt, Summerhill, near Wrexham
Frater, Mrs. ..... ,, ,, ,,
Freeman, Mr. C. E. .....Grange road, Brook lane
Freeman, Mrs. ..... ,, ,,
Frisby, Miss .....16 Chichester street
Fromont, Mr. W. H. .....Bridge street row (West)
Frost, Sir Thomas G., J.P. .....Redcliff, Queen's park
Frost, Lady ..... ,, ,,
Frost, Mr. J. G., J.P. ..... ....Boughton Hall
Frost, Mrs. ..... ,, ,,
Frost, Mr. J. M., J.P. ..... ....Upton Lawn
Frost, Mrs. ..... ,, ,,
Frost, Mr. T. Gibbons .....Mollington Banastre
Frost, Mrs. ..... ,, ,,

Gamon, Mr. John .....The Quilletts, Liverpool road
Gardner, Mr. E.....9 Abbey street
Garnett, Mrs. ..... The Rectory, Christleton
Garside, Mr. Franklin .....14 Bouverie street
Garside, Mrs. ..... ,, ,,
Garside, Miss ..... ,, ,,
Gerrard, Miss .....Fuller's moor, Broxton
Gibson, Major.....Buckley, *via* Chester
Gibson, Miss .....2 Paradise row
Gibson, Mr. John .....5 Abbot's nook, Victoria road
Giffen, Mr. J. T. M., F.R.C.S. ..Richmond hill, Boughton
Gilbert, Mr. Egerton.....21 Eaton road
Gilbert, Mrs. ..... ,, ,,
Giles, Mr. E. S..... .....Gowymede, Vicar's Cross
Giles, Mrs. ..... ,, ,,
Glascodine, Miss .....4 King's buildings
Golder, Mr. Jas. T. .....36 Hough green
*Goodman, Mr. A. E. .....Oakdene, Tarvin road
Goodman, Mrs. W. ..... ,, ,,
Goodhart, Mrs. E. S. .....100 Watergate flags
Gore, Ven. Archdeacon, D.D.....Bowdon, Cheshire
*Granger, Mr. F. M., M.R.C.S., L.R.C.P...18 Nicholas street
Granger, Mrs. ..... ,, ,,
Grantham, Rev. H. .....S Mary's Rectory
Grantham, Miss Gwynydd ..... ,, ,,
Gray, Miss .....6 Lorne street
Greenhouse, Mr. Chas. .....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S., M.B.M.S. } 31 Shrewsbury road, Birkenhead

Greig, Mrs. .....Anfield, Dee banks, West
Griffin, Rev. T. A. .....16 Deva terrace
Griffith, Mr. G. R. .....Grosvenor street
Griffith, Mr. G. B. .....Rose Villa, 11 Eaton road
Griffith, Mr. W. R. .....Rydal Mount, Upper Bangor, N. Wales
Griffiths, Miss .....2 Holly bank, Queen's park
Griffiths, Mr. John ..... ,, ,,
*Griffiths, Rev. T. T., M.A. ..... ,, ,,
Griffiths, Mr. Robert .....West hey, Hough green
Griffiths, Mrs. ..... ,, ,,
Griffiths, Miss Bessie ..... ,, ,,
Griffiths, Mr. W. A. .....20 Prince's avenue
Griffiths, Miss .....90 St. Anne street
Griffiths, Mr. John .....The Hollies, Upton park
Grindley, Mr. J. .....3 Eastgate street
Gritton, Mr. Joseph .....Elmdon, Newton lane
Grills, Dr. .....The Asylum, Chester
Gunton, Miss .....2 Church street
Gunton, Mr. Ernest Stirling .... ,,

Hallmark, Miss Amy .....Melville, Hoole road
Hale, Mr. T. A. .....Deva lea, Dee banks
Hales, Miss .....Cop house, Sealand road
Hamilton, Mr. A., M.R.C.S. ....16 White friars
Hamilton, Mrs. ..... ,,
Hamilton, Mr. A. G., M.B. .....23 Hoole road
Hampson, Mr. R. .....Halkyn road, Flookersbrook
Hannon, Miss .....Queen's park
Harris, Mr. T. .....Claremont, Dee banks
Harris, Mrs. ..... ,, ,,
Harrison, Mrs. .....Highfield, Curzon park
Harley, Mr. T. D. .....21 Blacon terrace
Harvey, Miss .....Fern Lea, Stamford Bridge, nr. Chester
Haswell, Mr. G. H. .....Queen's park
Haswell, Mrs. ..... ,, ,,
Haswell, Mr. W. H. .....94 Foregate street
Haswell, Mr. Geo. W. .....28 Bouverie street
Haswell, Miss F. E. .....31 Parkgate road
*Hawkins, Mr. J. M. .....Glan Aber park
Haycock, Rev. H. E. .....59 Parkgate road
Henderson, Mr. J. E. .....19 Pathway, Queen's park
Henderson, Mrs. .....Union Walk, Chester
Henshall, Mr. James, Junr. ....22 Bouverie street
Henshaw, Mr. T. .....The Hollies, Liverpool road
Henshaw, Miss Florence M .... ,, ,,
Heppel, Miss .....16 Hough green
Heppel, Mrs. .....Windsor Lodge, Mickle Trafford
*Hetherington, Mr. T. ....Engineers' Department, The Post Office, Glasgow
Hewitt, Mr. David L. .....Abbey House, Northgate street
Hickey, Mrs. Godfrey .....1 Eastern pathway, Queen's park
Higgins, Miss Eva .....The Manor, Overleigh
Higgins, Miss Millie ..... ,, ,,
Higginson, Mr. T. .....7 South view, Eaton road
Hignett, Mrs. .....28 Hough green
Hignett, Mrs. T. H. .....Shandon, Hough green
Hilton, Mrs. .....Talbot Hotel
*Hilton, Mr. Rob .....49a Northgate street
Hincks, Mr. J. W. .....Brantwood, Brook lane
Hincks, Mrs. ..... ,, ,,
Hobday, Mr. J. .....Alexandra Villa, Liverpool road
Hobday, Mr. E. ..... ,, ,,

Hobday, Mr. Wm. Edward.....22 The Groves
*Hodges, Mr. W. .....62 Hough green
Hodgson, Mr. Wm. W. .....65 Northgate street
Hodkinson, Mrs. .....39 White Friars
Hodkinson, Mr. E. ..... ,, ,,
Holland, Miss .....11 Derby place, Hoole road
Holland, Miss .....Bryn-y-Grog, Wrexham
Hollis, Rev. Thomas .....18 Eaton road
Hollis, Mrs. ..... ,, ,,
Holliday, Mr. Charles E. .....Rose Cottage, Hoole road
Holme, Rev. Canon, M.A.....Great Budworth, Northwich
Holmes, Mr. J. G , J.P. .....Belmont, Curzon park
Holme, Mr. Samuel H. .....Downswood, Liverpool road
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopley, Mr. J. H.....6 Northgate street
Hopley, Mrs. ..... ,, ,,
Hopton, Mrs.....3 Cheyney road
Hopwood, Miss .....The Deanery
Hornby, Mr. Alex. .....Woodville, Brook lane
Hornby, Mrs. ..... ,, ,,
Horner, Mr. W. .....42 Grey Rock street, Liverpool
Hostage, Mr. George B. .....30 Eaton road
Hostage, Mrs. ..... ,, ,,
Hostage, Miss .....24 Eaton road
Howson, Rev. J. F., M.A. .....Egerton House, Upper Northgate street
Howson, Miss ..... ,, ,, ,,
*Howe, Rev. W. Norton, M.A. } 84 Margaret street, Cavendish square, London, W.
Howick, Mr. T. S. Keith .....22 St. Martin's fields
Hughes, Mrs. McKenny .....18 Hills road, Cambridge
Hughes, Mr. John .....47 Victoria street, Westminster, London
Hughes, Miss .....Wepre Cottage, Connah's Quay
Hughes, Mr. T. Cann, M.A , F.S.A..78 Church street, Lancaster
Hughson, Mr. Arthur .....Surveyor, Mollington, Chester
Humphreys, Mr. E. Noel.....Caer y Cael, Hoole
Humphreys, Mrs. ..... ,, ,,
Humphreys, Miss Lilian .....5 Hamilton street, Hoole
Hunter, Mr. Jas. .....Maisonette, Hough Green
Hunter, Mrs. ..... ,, ,,
Hunter, Mr. Jas. de Graaff .....Pembroke College, Cambridge
Hunt, Mr. L. J.....Redcot, Conway street, Rhyl
Hutchings, Mr. J. Hanmer .....Arosfan, Deganwy, N. Wales
Hutchings, Mrs..... ,, ,, ,,
Huxley, Miss M. E. .....41 Cheyney road
Huxley, Miss Ann..... ,, ,,

Illingworth, Mr. F. H.....34 Liverpool road
Illingworth, Mrs. ..... ,, ,,

Jack, Mr. A. S. .....Belle Vue, 72 Hough Green
Jackson, Miss.....52 Hough Green
James, Rev. T. D. .....Llanerfyl Rectory, Welshpool
*James, Rev. Frank, M.A. .....Rossett Vicarage, near Wrexham
James, Mr. J. F. .....17 Mount Pleasant, Saltney
*Jebb, Mr. G. R., C.E. .....Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S. } 2 The Northgate
Jephcott, Mrs. ..... ,, ,,
*Johnson, Mr. M., L.D.S.I. .....21 York villas, Lorne street
Johnson, Mr. Thomas C. .....30 Eastgate row
Johnson, Mr. Noel .....Warwick Road Hall, Bowdon

Johnson, Mr. Sidney M. .....18 Bouverie street
Johnson, Mrs. Mayo .....10 Lorne street
Jolliffe, Mr. H. D.....Queen's park
Jones, Miss.....3 Lorne street
Jones, Mrs. Edward .....1 Derby place, Hoole
Jones, Mr. Jno. .....The Spinney, Hunter street
Jones, Mrs..... ,, ,,
Jones, Mr. David Brellisford ....11 St. Anne street
Jones, Mr. W. S. .....North and South Wales Bank
Jones, Mr. Owen E., J.P. .....Tynrheol, Amlwch
Jones, Mr. Fred. .....112 Foregate street
Jones, Miss .....2 Hunter street
Jones, Mrs. W. H. .....4 Abbey street
Jones, Miss F. Bannister ..... ,, ,,
Jones, Miss Gertrude A. ..... ,, ,,
Jones, Mrs. Evan .....Bodrenig, Bala, N. Wales
Jones, Mr. W. Matthews.....Louise street
Jones, Mrs. Wm. .....Cuppin street
Jones, Mr. Henry .....Gwynedd, 131 Boughton
Jones, Mr. O. R., H.M.I.M. ....5 Spring Gardens, Hoole
Jones, Mr. Robert W. .....Cambrian view
Jones, Miss Mima .....3 Eastern pathway, Queen's park
Jones, Mr. Charles .....50 Princess street
Jones, Mr. W. B. .....The Post-office, Hawarden
Joyce, Rev. G. C., M.A. .....St. Deiniol's Hostel, Hawarden
Joyce, Rev. F. Hayward .....9 Abbey square

Kelsall, Miss H. .....Abbot's court, Liverpool road
Kenyon, Mr. G. A., M.B. .....Flookersbrook
Kenyon, Mrs..... ,,
Kember, Miss M. .....8 The Groves
Killick, Mr. George .....Eaton, Chester
Killon, Mr. R. W. .....16 Egerton street
*King, Dr. H. W. .....26 Nicholas street
King, Mrs..... ,, ,,
*Kingsley, Miss .....Keys, Eversley, Winchfield
Knight, Miss .....8 Eastgate row
Knowles, Mr. E. R.....15 Grosvenor street
Knowles, Miss ..... ,, ,,
Kynnersley, Mr. E. M. Sneyd....Boughton Lodge

Lacy, Mrs. .....Moore Holme, Neston
Laing, Miss S. C. .....7 Chester street, Saltney
Lamb, Mr. R., Junr. .....Yrfon, Granville road
Lamb, Mrs..... ,, ,,
Lamont, Mr. A.....Arlington, Pole Hill, Heswall
Lanceley, Mr. R. H.....Victoria road
Latham, Mr. J. S.....Green bank, Liverpool road
Latham, Mrs..... ,, ,,
*Lawrence, Dr. A. .....The Asylum, Chester
Laybourne, Mr. J. H. .....21 The Groves
Laybourne, Mrs. ..... ,, ,,
Ledsham, Mr. Wm. .....Coal Exchange
Lees, Mr. W., M.R.C.S.....The Bars
Lewis, Rev. J. S., M.A. .....The Vicarage, Ruabon
Littler, Miss .....132 Overleigh road, Handbridge
Lloyd, His Honour Sir Horatio ..Stanley place
*LLoyd, Colonel Wilford .....Eccleston Hill, Chester
LLoyd, Mrs. ..... ,, ,,
Lloyd, Miss M. E. .....13 Chichester street
Lloyd, Miss C. .....62 Princess street

Lloyd, Mr. F. Horatio .....11 Stanley place
Lloyd, Mr. G. .....38 Duke street
Lloyd, Mr. W. H.....Glenhurst, Hoole road
Lockwood, Mrs. .....7 Queen's park
Lockwood, Miss Amy .....90 Foregate street
Lodge, Mr. Geo. T. .....St. Catherine villa, Lord street
Long, Mrs. .....11 Lumley road
Long, Miss F. ..... " "
*Longbottom, Mr. F. W. .....Haslemere, Queen's park
Longbottom, Mrs. ..... " "
Lowe, Miss C. H. .....Onneley house, Liverpool road
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. } 18 Hough green
Lowe, Mrs. ..... " "
Lowe, Mr. Jas. F., B.A. ..... Dee banks
*Lucas, Mr. A. W., F.G.S. .....Queen's park
Lund, Mr. R. S. .....12 Bridge street
Lutener, Rev. Wm. .....Beech Holme, 8 Curzon park

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Miss Eva ..... " "
*Macdonald, Mr. G. E., L.D.S.E..10 Bladud buildings, Bath
MacGillycuddy, Major .....Bache Hall, Chester
MacGillycuddy, Mrs. ..... " "
Maddocks, Mr. Frank .....Riverlea, Dee banks
Mann, Mr. A., M.B. .....Newgate street
Mann, Mrs. ..... " "
*Manning, Mr. J. B. .....27 Perryn road, East Acton, London, W.
Marriott, Mr. J. W. .....The Grosvenor Museum
Marsden, Miss .....6 Grosvenor park road
Massey, Miss .....1 Parkgate road
Mason, Mr. F. B. .....1 Exton park
Mason, Mrs. ..... " "
Mathews, Mr. D. H. F. ..... Kilmorey park, Hoole
McCulloch, Mr. A. M. .....Lime Grove
McCulloch, Mrs. ..... " "
*McMichael, Mr. J. A., B.A., B.Sc...39 Parkgate road
McMichael, Mrs. ..... " "
Meacock, Miss .....White Friars Cottage
Meacock, Mr. Guy .....Bridgegate House, Bridge place
Meacock, Miss ..... " "
Meeson, Mr. W. H. .....16 Eastgate row
Mellor, Miss S. .....Burley, Queen's park
Mill, Miss F. .. .....24 Eaton road
Mill, Miss Frances..... .....St. Mary's Rectory
Millington, Mr. C.....Victoria House, Victoria road
Millington, Mrs. ..... " "
Mills, Mrs. .....Derby House, Hoole
Mills, Mr. Edwd. Julian ..... " "
*Miln, Mr. G. P. .....Milnholme, Brook lane
Miln, Mrs. ..... " "
Miln, Mr. T. E. ..... " "
Milton, Mr. Frank T. .....28 Queen's avenue, City road
Minns, Mr. Alfred..... .....122 St. Anne street
Minshull, Mr. C. H. ..... 5 Lorne street
*Mitchell, Rev. J. C., B.D., F.R.A.S..Rutland Cottage, Parkgate road
Monkhouse, Miss M. .....14 Sibell street
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Rossiter, Miss C. M. ..... " "
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Royle, Mrs. ..... " "
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MDCCCCIII.

# CHESTER SOCIETY
## of
# NATURAL SCIENCE
# LITERATURE & ART

FOUNDED BY CHARLES KINGSLEY

1871

THIRTY-THIRD

ANNUAL REPORT

& PROCEEDINGS

FOR THE YEAR

1903-1904.

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*Special attention is directed to the List of Lepidoptera found in Cheshire, Flintshire, Denbighshire, Carnarvonshire, and Anglesea (Proceedings No. V.), which has recently been published by the Society. Copies may be obtained from the Curator, at the Museum, price 2/6 each (Post free 2/8).*

# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY, 1871).

## THIRTY-THIRD

# ANNUAL REPORT

INCLUDING

## STATEMENTS OF ACCOUNTS, &c.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art, by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Eight Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any Candidate for Membership of the Society, with those of a Proposer and a Seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

7.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each —except to the Annual General Meeting, to which Members only are admitted.

8.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

9.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

10.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

11.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

12.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

13.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

14.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement made up to the end of April, and duly audited, shall also be submitted, and read if desired.

15.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

16.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

17.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

18.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1904-1905.

## President:

REV. A. H. FISH, B.A., B.Sc.

## Vice-Presidents:

PROF. T. McKENNY HUGHES, F.R.S. | H. STOLTERFOTH, ESQ., M.A., M.D., J.P.
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W. M. DOBIE, ESQ., M.D., J.P., F.R.A.S. | G. R. GRIFFITH, ESQ.
J. D. SIDDALL, ESQ.

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SECRETARY—MR. A. E. GOODMAN ... ... ... *Oakdene, Tarvin Road*

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### PHOTOGRAPHIC.

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SECRETARY—MR. J. A. McMICHAEL, B.A., B.Sc .. 39, *Parkgate Road*

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SECRETARY—DR. J. T. ROBERTS ... ... ... *Dorchester House*

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SECRETARY—MR. F. W. LONGBOTTOM ... ... *Haslemere, Queen's Park*

### ART.

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SECRETARY—MR. WALTER SCHRÖDER, A.R.C.A.... 32, *Eaton Road*

## Hon. Treasurer:

MR. JOHN SIMON, 4, *Eastgate Row.*

## Hon. Secretaries:

*Scientific*—DR. STOLTERFOTH, M.A., 1, *Grey Friars.*

*General* { MR. G. P. MILN, *Milnholme, Brook Lane*
MR. W. F. J. SHEPHEARD, F.C.S., *Bridge Street Row.*

## Hon. Librarian:

MR. R. NEWSTEAD, A.L.S., F.E.S., *The Grosvenor Museum.*

## Committee:

THE ABOVE OFFICURS *(Ex-officio)*
AND

REV. J. L. BEDFORD, M.A., F.L.S. | MR. E. HODKINSON
MR. J. DAY | DR. KING
MR. J. LYON DENSON | MR. W. SHONE, F.G.S.
DR. J. DUFF | MR. W. W. SIDDALL
DR. GRANGER | DR. JAMES TAYLOR
DR. HAMILTON | MR. J. R. LE B. TOMLIN, M.A., F.E.S.

## Hon. Auditors:

MR. BERESFORD ADAMS. MR. E. NOEL HUMPHREYS, C.A.

## Curator:

MR. R. NEWSTEAD, A.L.S., F.E.S., *The Grosvenor Museum.*

## Assistant Secretary:

MR. H. NEW.

## Representatives of the Society upon the Grosvenor Museum Management Committee.

REV. A. H. FISH, B.A., B.Sc. | MR. G. P. MILN | MR. J. BAIRSTOW, F.C.S.
MR. J. D. SIDDALL | MR. JOHN SIMON | MR. G. WATMOUGH WEBSTER, F.C.S.

## HON. SECRETARIES' REPORT.

YOUR Committee have a special pleasure in presenting this, the Thirty-third Annual Report. For the first time in the history of the Society, the membership at the Annual General Meeting is over a thousand strong.

During the past year 148 new Members have joined the Society, and although we have lost by deaths, removals, and resignations, 108, there has been a nett increase of 40, which brings the full number at present to 1,011.

The Balance Sheet will shew that the finances of the Society are in a satisfactory condition; for although we have had to meet an extraordinary expenditure of £37 4s. 3d., in consequence of our publication of a "List of Lepidoptera of the District," by MR. GEORGE DAY and others, the small adverse balance, which the Treasurer will report, is very little more than it was at the commencement of the past year.

Rather fewer Excursions and Field Meetings than usual have taken place during the past year, but this has been more than counter-balanced by the largely increased numbers at the Lectures and Sectional Meetings during the Winter Session.

It is a great pleasure to your Committee to mark this increase, shewing as it does a growth of interest in the work of the Society, which is the best pledge of its stability and growing usefulness.

Since the Grosvenor Museum was erected, eighteen years ago, it has been the scene of the Society's Annual Conversazione, but for many years the accommodation has been felt to be too restricted. This year an old custom was reverted to, and the Conversazione was once again held in the Town Hall. The change proved to be more than justified, not only by the largely-increased attendance, but by the greater convenience and comfort afforded to all.

The Excursions and Field Meetings held during the Summer were as follows:—

| | 1903. |
|---|---|
| Bache Hall Gardens and Pinetum | May 20th |
| The Vale of Gresford and the Rofts | ,, 27th |
| Delamere Forest and Meres | June 10th |
| Dr. Mules' Gardens at the Old Parsonage, Gresford | ,, 24th |
| Rhuddlan, Dyserth, Gwaenysgor, and Meliden (Annual Excursion) | ,, 27th |

1903.

Evening Meeting at the Grosvenor Museum .....July 8th
Ball's Knolls, Mollington Meadows, &c. ..... ,, 15th
Buckley and Ewloe Castle—including Penyffordd and Church *en route* ..... ,, 22nd
The Water-Tube Boiler Works of Messrs. Willans & Robinson, Ltd., Queen's Ferry .....Sept. 9th
The Chester United Gas Company's Works..... ,, 23rd

During the Winter Session nine General and seventeen Sectional Meetings were held as follows:—

## GENERAL MEETINGS.

1903.

Oct. 1st—"A Holiday Trip to Zermatt,"—DR. A. HAMILTON.

,, 22nd—Annual Conversazione in the Town Hall.

Nov. 5th—"A Holiday in the 'Westward Ho!' Country of Devonshire"—MR. J. D. SIDDALL.

Dec. 3rd—"Radium and Radio-Activity: a new chapter in the history of Science"—The President, REV. A. H. FISH, B.A., B.Sc.

1904.

Jan. 7th—"Living Pictures of Living Types of Animal and Vegetable Life"—MR. J. D. SIDDALL.

Feb. 4th—"Life in Japan"—MISS E. P. HUGHES (late Principal Training College, Cambridge).

Mar. 3rd—"A Holiday Trip to Arolla"—DR. A. HAMILTON.

,, 24th—"A short history of Steam Navigation on the Atlantic"—MR. J. B. KENNEDY.

*** The above Lectures were illustrated by Lantern Slides, &c.

Apr. 19th & 20th—Exhibition of Spring Flowers, by MEMBERS OF THE CHESTER PAXTON SOCIETY AND OTHERS.

## SECTIONAL MEETINGS.

### BOTANICAL.

1903.

Nov. 26th—"The Cytology and Natural History of Dictyota dichotoma," by MR. J. LLOYD WILLIAMS, B.Sc. (University College of North Wales, Bangor).

1904.

Mar. 17th—"The Wild Flowers of Wirral," illustrated by a Collection of Dried Plants, by DR. C. THEODORE GREEN, F.L.S., &c. (Birkenhead).

### ZOOLOGICAL.

1903.

Nov. 12th—"Recollections of my Indian Experience," by MR. J. THOMPSON.

1904.

Feb. 18th—Notes and observations during the past year:

| | |
|---|---|
| Observations on the Birds of the District, &c. | THE CHAIRMAN (DR. HY. DOBIE)<br>MR. SIDNEY G. CUMMINGS<br>MR. J. THOMPSON |
| Entomological Notes - - | MR. J. ARKLE. |
| Further Notes on the habits of the Lesser Horseshoe Bat<br>**Illustrated by Photographs from Life** | THE CURATOR (MR. R. NEWSTEAD). |

## GEOLOGICAL.

1903.

Dec. 17th—"The Microscopic story of the Rocks," by MR. A. W. LUCAS, F.G.S.

1904.

Mar. 10th—"The character and development of the Mountain-Land of Wales," by MR. EDWARD GREENLY, F.G.S. (Bangor, N.W.)

## NATURAL PHILOSOPHY.

1903.

Oct. 8th—"Modern Chemistry," by MR. J. BAIRSTOW, F.C.S.

1904.

Jan. 14th—"The Evolution of Steam, and its Practical Application," by MR. A. T. BENNETT.

Feb. 25th—"The Unseen World of Science," by REV. P. J. BEVERIDGE, M.A., B.Sc.

## MICROSCOPICAL.

1903.

Dec. 10th – An Exhibition of various interesting Microscopic objects (living and mounted), by MEMBERS OF THE SECTION.

## PHOTOGRAPHIC.

1903.

Oct. 29th—Holiday Lecturettes, illustrated by Lantern Slides, by MEMBERS.

1904.

Feb. 11th to 24th—Photographic Exhibition by MEMBERS OF THE SECTION.

Apr. 14th—Lecturettes by MEMBERS OF THE SECTION.

## LITERATURE.

1903.

Nov. 12th—"Browning as the Apostle of Effort," by MISS B. CLAY, B.A.

1904.

Jan. 28th—"The influence of Literature," by MR. MORYS PARRY.

## ASTRONOMICAL.

1903.

Oct. 15th—"An Hour with the Modern Telescope," by MR. THOS. S. WILKINS (Uttoxeter).

1904.

Jan. 21st—"Astronomical Literature (Old and New)," by DR. WHICHELLO.

NOTE.—Most of the above Sectional Meetings were suitably illustrated by Lantern Slides, &c.

Your Committee wish to place on record the help rendered on several occasions by the Members of the Paxton Society, especially in the case of the Exhibition of Spring Flowers organized and carried out by them. This was of a larger and more interesting character than anything of the kind previously attempted in Chester.

The success which attended the recent Exhibition of Photographs was very gratifying, and it is to be hoped that the Members of the Photographic Section will arrange for similar Exhibitions to be held during the coming year.

Your Committee desire also to draw attention to the fact that, in conjunction with the Archæological Society, they have, with the sanction of the Management Committee, undertaken the enterprise of fitting up the large room on the right of the entrance as a Library for the accommodation of the Books belonging to the two Societies, and as a Reading Room to which Members desiring to consult books or periodicals may resort. They hope to be able to do this without drawing to any large extent on the current revenue of the Society. A substantial portion of what is needed has already been promised, and a Subscription List will shortly be sent to all Members of the Society.

They would also like to call attention to the Society's Museum, which represents a very large and important part of the Society's work. Slowly but surely, as the Curator's Report will show, it is becoming an even more worthy and adequate representation of the Natural History of the District — an indispensable adjunct, not only to the Naturalist and Collector, but to that general Nature-study towards which a good deal of educational attention is now being directed. They feel that more might be done, not only in adding to its specimens, but in making its existence and value more widely known. In this way, one of the most real and deserving of the objects of the Society would find a fuller realization.

Your Committee has met fourteen times during the year for the transaction of the Society's business, and these Meetings have been very fully attended.

GEORGE P. MILN, } *Hon. Gen.*
W. F. J. SHEPHEARD, } *Secretaries.*

GROSVENOR MUSEUM,
MAY 12TH, 1904.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1904.

| Dr. | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| By 909 Subscriptions for year 1903-4 @ 5/- | 227 | 5 | 0 | | | |
| ,, 30 Arrears ,, ,, 1902-3 @ 5/- | 7 | 10 | 0 | | | |
| ,, 3 ,, ,, 1901-2 @ 5/- | 0 | 15 | 0 | | | |
| ,, 1 ,, ,, 1900-1 @ 5/- | 0 | 5 | 0 | | | |
| | | | | 235 | 15 | 0 |
| Subscriptions unpaid—23 for 1903-4, 5 for 1902-3 } £7 | | | | | | |
| ,, Receipts from sale of *Lepidoptera* List | | | | 8 | 16 | 7 |
| ,, Donation from Mr. A. O. Walker for ditto | | | | 2 | 0 | 0 |
| ,, Gross Receipts from Excursions .. | | | | 25 | 12 | 1 |
| ,, Gross Receipts from Lectures, Evening Meetings, &c.— | | | | | | |
| Conversazione .. .. .. | | | | 17 | 7 | 1 |
| Dr. Hamilton (2) .. .. .. | £2 | 1 | 0 | | | |
| Mr. Wilkins .. .. .. .. | 0 | 1 | 0 | | | |
| Mr. McMichael and others .. .. | 0 | 3 | 0 | | | |
| Mr. Siddall (2) .. .. .. | 0 | 16 | 0 | | | |
| Miss Clay .. .. .. .. | 0 | 14 | 0 | | | |
| Mr. J. Thompson .. .. .. | 0 | 1 | 0 | | | |
| Mr. Bennett .. .. .. .. | 0 | 3 | 0 | | | |
| Dr. Whichello .. .. .. | 0 | 2 | 0 | | | |
| Mr. Morys Parry .. .. .. | 0 | 1 | 0 | | | |
| Miss Hughes .. .. .. | 1 | 3 | 0 | | | |
| Dr. Green .. .. .. .. | 0 | 1 | 0 | | | |
| Mr. Kennedy .. .. .. | 0 | 4 | 0 | | | |
| | | | | 5 | 10 | 0 |
| Special Lecture by Rev. A. H. Fish | | | | 21 | 10 | 6 |
| ,, Sale of Programmes at Photographic Exhibition | | | | 0 | 15 | 2 |
| Balance due to Hon. Treasurer (overdrawn on Lloyd's Bank, Limited) | | | | 8 | 15 | 5 |
| | | | | £326 | 1 | 10 |

| Cr. | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| To Balance from last Account .. .. .. .. | | | | 8 | 1 | 7 |
| ,, Management Committee Grosvenor Museum .. | | | | 75 | 0 | 0 |
| ,, Lantern Account .. .. .. .. .. | | | | 15 | 15 | 0 |
| ,, Natural History Museum and Library .. .. .. | | | | 24 | 10 | 7 |
| ,, Printing, Stationery, and Advertising .. .. | | | | 44 | 9 | 3 |
| ,, Publishing Mr. Day's Book on *Lepidoptera* .. .. | | | | 37 | 4 | 3 |
| ,, Postages .. .. .. .. .. .. | | | | 28 | 13 | 8 |
| ,, Gross Expenses in connection with Excursions .. | | | | 22 | 3 | 1 |
| ,, Gross Expenses in connection with Lectures, &c.— | | | | | | |
| Conversazione .. .. .. .. .. | | | | 30 | 8 | 11 |
| Expenses and Fees for Lecturers .. .. .. | | | | 8 | 4 | 6 |
| ,, Salary to Assistant Secretary, £15 (and Honorarium £5 for past year) .. .. .. .. .. | | | | 20 | 0 | 0 |
| ,, Subscriptions— | | | | | | |
| Palæontographical Society .. | £1 | 1 | 0 | | | |
| Entomological Society .. .. | 1 | 1 | 0 | | | |
| Ray Society .. .. .. | 1 | 1 | 0 | | | |
| Royal Photographic Society .. | 1 | 1 | 0 | | | |
| | | | | 4 | 4 | 0 |
| ,, Donation to Kingsley Memorial Fund— | | | | | | |
| Bideford .. .. .. .. | | | | 5 | 5 | 0 |
| ,, Collecting outstanding Subscriptions .. | | | | 2 | 2 | 0 |
| | | | | £326 | 1 | 10 |

Examined with the Accounts and Vouchers relating thereto and found to be correct, shewing a balance of £8 15s. 5d. due to the Hon. Treasurer.

CHESTER, 4th MAY, 1904.

JOHN SIMON, HON. TREASURER.

BERESFORD ADAMS,
E. NOEL HUMPHREYS, A.C.A. } HON. AUDITORS.

# CURATOR'S REPORT.

SINCE the last Report was presented in 1903, 937 species, representing, approximately, 2,262 specimens, have been added to the Society's Collections.

A group of Lesser Horse-Shoe Bats *(Rhinolophus hipposideros)* has been prepared from materials obtained by the Curator from the Cefn Caves, by kind permission of MRS. WILLIAMS WYNN.

By invitation of the Museum Management Committee, Scholars from the City Elementary Schools are attending a course of six Nature-Study Lessons, given by the Curator, and illustrated by specimens in the Society's Collections. The subjects chosen by the Director of Education are as follows :—

1. "Sponges from the Dee";
2. "Sea-urchins and Star-fish";
3. "Gall-makers and Leaf-miners";
4. "The Transformations of a Common Butterfly and a Moth";
5. "Humble Bees and Wasps";
6. "The Swallow and the Cuckoo."

The children attend twice weekly, in batches of from 40 to 50; Mondays being reserved for the boys, and Thursdays for the girls. The course of lessons began on March 14th, and will probably end on or about the first week in August.

The following abstract from the Report to the Board of Education, on the "Return of Visitors to the Museum," may not be without interest to the Members of the Society. From January to December (inclusive) in 1903 the total number of visitors was approximately 11,032; of this total 2,220 paid for admission, the entrance fees amounting to £27 15s.

The foregoing figures do not include the students and members of the various Societies who are admitted to the building. It is estimated that these, taken together, average a total of 1,241 per week for a period of nine months, giving a total of 44,676. Adding these latter to the figures given in the returns to the Board of Education, we have a grand total of, approximately, 55,000.

## LIST OF ADDITIONS.

THE REV. FATHER ALEXIS, O.S.F.C.—2 Meteorites.

MR. HUGH ALDERSEY—1 *Clytus arietis.*

MR. J. ARKLE—25 species *Lepidoptera*, representing 61 specimens; 2 species *Limnephilus sp.*; 1 *L. lunatus*; 1 *Hylobius abietis*; 1 Bramble gall *(L. rubi)*; 2 specimens *Mania maura.* 32 species, 64 specimens.

MR. F. F. BROWN—3 specimens of *Anobium domesticum.*

COLONEL B. G. DAVIES-COOKE—A long series of Corals of the genus *Cyathophyllum*; various Rock specimens; Lichens, and various other plants.

MR. SIDNEY G. CUMMINGS—1 *Dianthus armeria, L.*; 1 Nest and 3 Eggs of Cirl Bunting; 1 Egg of Yellow Wagtail. 3 species, 6 specimens.

THE CURATOR—2 Bald Coots; Life-History series of *Lepidoptera* and Pine Saw-fly (7 species, 30 specimens); 2 clutches of Moorhen's Eggs (remarkable white varieties); 2 clutches of Shell-Duck's Eggs (15 and 9).

COLONEL GEORGE DIXON—1 Water Rail; 1 Greenshank.

MRS. DOUGLAS—1 Dragonfly *(Æschna grandis).*

MR. H. B. DUTTON—2 species of Exotic *Orthoptera*, found on imported fruit.

MR. H. G. FEILDEN—1,296 mounted specimens of British Plants, including a representative series of local species; 1 Rosewood Cabinet; 288 specimens of Minerals and Rocks.

MR. W. HAGUE—Parasitic Acarina *(Ixodidæ)*.

MRS. F. HIBBERT—1 species of Fungus.

ALDERMAN JOHN JONES (Hunter St.)—Series of Animal Bones, principally of *Bos longifrons*, together with Shells of *Mytilus*, *Cardium*, &c, (Old Bed of River Dee, at Sewage Works).

SIR JOHN MARK—1 Cormorant.

MR. G. MOORE—1 Water Shrew *(Sorex fodiens)*.

MR. ALFRED NEWSTEAD—Pink-breasted variety of the Common Gull.

MR. CHAS. OLDHAM—1 clutch of Garden Warbler's Eggs; 3 Glow Worms *(Lampyris noctiluca)*; Notes and observations on the occurrence of a local specimen of the Sandgrouse, in 1888 *(see p.* 13).

MISS STEELE PERKINS—40 species *Lepidoptera*, representing 93 specimens.

MR. S. WILSON ROBERTS—1 Photograph of Mistle Thrush's Nest.

MRS. ROYDS—*Anodonta cygnea.*

MISS HESTER SANDBACH—1 Sparrow Hawk.

MR. THOS. SHEPHEARD—1 framed Photograph of Lord Kelvin; 1 framed Photograph of Geo. J. Allman. 1 glazed Case of British Birds, said to have been procured on the shores of the Wirral Peninsula; the following is a list of the species:—1 Knot (*Tringa canutus*, L.); 1 Sandpiper (*Totanus hypoleucus*, L.); 2 Ruff (*Machetes pugnax*, L.); 1 Redshank (*Totanus calidris*, L.); 2 Golden Plover (*Charadrius pluvialis*, L); 1 Black-winged Stilt (*Himantopus candidus*, Bon.); 1 Avocet (*Recurvirostra avocetta*, L.); 1 Spoonbill (*Platalea leucorodia*, L.); 1 Purple Heron (*Ardea purpurea*, L.); 2 Night Heron (*Nycticorax griseus*, L.); 1 Common Heron (*Ardea cinerea*, L.); 1 Gannet (*Sula bassana*, L); 2 Teal (*Querquedula crecca*, L.); 1 Grey Plover (*Squatarola helvetica*, L.); 1 Spotted Sandpiper* (*Totanus macularius*); 1 Kildeer Plover† (*Ægialitis vocifera*, L.); total, 19 species, 23 specimens.

MR. WM. SHONE—27 Lantern Slides (2nd series), issued by the British Association.

MR. J. D. SIDDALL—1 Nemertine Worm *(Lineus sp.)*

MR. WM. LESTER SMITH—Many larvæ of Pine Sawfly *(Lophyrus pini)*; Mysogastres *(Physarum cinéreum)*, on grass.

MR. E. J. BURGESS SOPP—*Anisotoma furva*; 1 *Anthicus bimaculatus.*

DR. HENRY STOLTERFOTH—5 specimens of *Hypoxylon sp.*

MR. BROCKTON TOMLIN—3 *Lathridius bergrothi.*

MR. TRAFFORD—2 fine specimens of a species of *Lepidodendron.*

MESSRS. HENRY WOOD & CO.—Copy of Report on Analysis of the Water at Saltney.

MISS WARD (20, Eaton Road, Chester)—6 fascicles of British Willows, arranged in 3 series; series *(a)* consisting of 99 species and varieties; series *(b)* of 95 species and varieties; and series *(c)* of 29 species and varieties. *This collection was formed by the (late) Rev. J. E. Leete.*

KINGSLEY MEMORIAL COLLECTIONS—Specimens of *Chermes laricis* and *Psylla fraxini*. S. STENDALL, Collector.

Purchased—1 *Acherontia atropos.*

Purchased—80 specimens of *Cephalopods*, &c., from the Carboniferous Limestone. H. HUGHES, Collector.

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* This American species does not now claim a place in Saunders' "British Birds."

† One authentic British example is recorded by Saunders.

## ADDITIONS TO THE SOCIETY'S LIBRARY, 1903-1904.

### DONATIONS.

Anglesey, Notes on the Birds of, by T. A. Coward and C. Oldham. *The Authors.*

British Association Handbook, Southport, 1903. *Dr. Francis J. Baildon.*

Chester Society of Natural Science, Proceedings of the (Part V.)

Chester Society of Natural Science, 24th Report, 1894-5. *Mr. W. Henderson.*

Chester Society of Natural Science, Reports for the years 1889-90 and 1893-4. *Mr. W. Hodges.*

"Coleoptera of the Southport District," by E. J. Burgess Sopp. *The Author.*

Dorset Natural History and Antiquarian Field Club, Vol. XXIII. *Mr. Thos. Shepheard.*

"Germination de l'Ascospore de la Truffe," by M. Emile Boulanger, Paris, 1903. *The Author.*

Glasgow Museums and Art Gallery, Report for the year 1902.

"Handbook of Instruction for Collectors"; "Guide to the Coral Gallery," 1904. *The Trustees of the British Museum of Natural History.*

Journal of the North Hants Natural History Society, Vol. XX. *Mr. T. Shepheard.*

"Land and Freshwater Shells of the Channel Isles" (Reprint). *Mr. Brockton Tomlin* (joint Author), 1903.

"Questions de Morphologie et de Biologie végétales, by C. Candolle (Est. des Archives des Sciences, &c.), 1903. *The Author.*

Report of the Delegates of the University Museum, Oxford, 1901. *Mr. Brockton Tomlin.*

Report of the Plymouth Museum. *The Curator (Mr. E. Ernest Lowe)*, 1903.

"Southport; A Handbook of the Town and surrounding district"—British Association, 1903. *Mr. E. J. Burgess Sopp.*

"Southport; Excursion Handbooks—British Association, 1903. *Mr. E. J. Burgess Sopp.*

"The Field." *Mr. Rowson.*

"The Field Naturalists' Quarterly," Vol. I. (1902). *Mr. Chas. Oldham.*

"The Irish Naturalist," 1903. *Mr. Charles Oldham.*

The Scientific papers of Thomas Andrews, M.D., F.R.S., with Memoir, by P. G. Tait and A. Grum Brown, 1889. *Miss Mary K. Andrews.*

"Welsh Botanology; A Systematic Catalogue of the Native Plants of the Isle of Anglesey," by Hugh Davies, F.L.S., 1813. *Mr. H. G. Feilden, Mollington Hall, Chester.*

### BY EXCHANGE.

Annual Report of the Barrow Natural History Field Club, 1903.

Annual Report of the Brighton and Hove Natural History and Philosophical Society, 1903.

Annual Report and Proceedings of the Manchester Microscopical Society, 1902.

Annual Report and Transactions of the Nottingham Naturalists' Society, 1902-3.

Annual Report and Transactions of the North Staffordshire Field Club, 1902-3.

Annals of the Natural History Museum, Vienna, 1902, 1903.

"Atmospheric Moisture as a factor in distribution" (Ext. Trans. of the South-Eastern Union of Scientific Societies, 1903).

Bulletin of the Lloyd's Library of Botany, Pharmacy, &c.—Cincinnati, Ohio. Reproduction Series, No. 3 *(Materia Medica Americana potissimum regni vegetabilis Erlangæ sumptibus* IO-*Jac. Palmii, MDCCLXXXVII).*

Cold Spring Harbour Monographs: *(i.)* "The Beach Flea, *Talorchestra longicornis,*" by E. M. Smallwood; *(ii.)* "Colembola," by C. B. Davenport (issued by the Brooklyn Institution of Art and Science).

"Fauna and Flora of the Trias of the British Isles"—Report of the British Association, per Mr. J. Lomas.

Memo. and Proceedings of the Manchester Literary and Philosophical Society, Vol. XLVII. (1903).

"Meteorological Observations and Essays, 1834" (2nd Edition), by John Dalton.

Proceedings of the Geological Institute of Mexico, 1903.

Proceedings and Annual Report of the Liverpool Geological Association, 1903.

Proceedings of the Geologists' Association, 1903.

Proceedings of the Liverpool Naturalists' Field Club, 1904.

Reports of the Lancashire and Cheshire Entomological Society, 1903.

Report of the Missouri Botanic Garden, 1903.

Report and Proceedings of the Science Gossip Club, Norwich, May 1902.

Report and Proceedings of the Southport Society of Natural Science, 1902-3.

Smithsonian Institution Report, 3 vols. (1901-2).

"Some Volcanic Ash-beds of Montana," by J. P. Rowe, University of Montana, 1903.

The University of Colorado, Studies, Vol. I., No. 4 (1904).

Transactions of the Herefordshire Natural History Society and Field Club, Vol. XI. (1902-3).

Transactions of the Hertfordshire Natural History Society and Field Club, 1902.

Transactions of the Manchester Geological Society, Vol. XXVIII.

Transactions of the Manchester Mining and Geological Society, 1904.

"The Sea-Board of Mendip," by F. A. Knight, 1902.

United States' Geological Survey, 1902 (13 papers) 1903.

United States' Geological Survey, 22nd and 23rd Annual Reports, 1903.

## BY SUBSCRIPTIONS.

"The Entomologist," 1903.

"The Naturalist," 1903.

Transactions of the Palæontographical Society, Vol. LVII.

The Ray Society's Publications:—"The Coccidæ of the British Isles" (Newstead), Vol. II. "The British Tyroglyphidæ" (Michael), Vol. II.

Transactions of the Entomological Society of London, 1903.

ROBT. NEWSTEAD, A.L.S., &c.,
*Curator and Librarian.*

APRIL 29TH, 1904.

## AN UNRECORDED CHESHIRE SANDGROUSE

(*Syrrhaptes paradoxus*, Pall.),

By Mr. Chas. Oldham.

Mr. W. Beaumont, of Southport, has kindly allowed me to examine a Pallas's Sandgrouse in his Collection, which was shot by a man named James Mote in 1888, on the hillside between Arnfield Clough and North Britain Farm, near Stalybridge. The bird is a male, having long central tail feathers and a narrow interrupted black gorget. It was brought in the flesh to Mr. Beaumont, who was then living at Hollingworth, and was set up by Ben Clegg, an Oldham taxidermist. I have a letter from Mote to the effect that he shot the Sandgrouse as it flew over him at a good speed, "making a noise something like *cluck, cluck, cluck.*" The occurrence of the species in East Cheshire is, perhaps, worthy of record, for, so far as I know, the only other examples obtained in the County during the 1888 invasion, were shot in Wirral.

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## RED-NECKED GREBE IN CHESHIRE

(*Podiceps griseigena*, Bodd.),

By Mr. Chas. Oldham.

Mr. Seth Radcliffe, an old and leading member of the Mossley Field Naturalists' Society, informs me that a Red-necked Grebe, in the Society's Collection, was shot on the River Tame, near the Stamford Mills, Mossley, by a man named Giles Andrew, in 1868 or 1869. The label recording the exact date, which was formerly attached to the case containing the bird, has, unhappily, been destroyed. The history of the specimen seems to be quite satisfactory, as Mr. Radcliffe's account of it is corroborated by other members of the Society whom I have seen. The Grebe is in immature plumage, the neck being rich red-brown in colour, and the white cheeks streaked with greyish-brown. Mr. F. Stubbs, of Oldham, who directed my attention to the bird, has made a water-colour drawing of it, in which these characters are clearly shown. The existence of the Mossley specimen is of some interest, as the only other evidence of the occurrence of this Grebe in Cheshire is the somewhat vague statement of Brockholes ("Birds of Wirral," p. 15) that it is occasionally obtained in the estuary of the Dee. Dr. Dobie has pointed out ("Report of the Chester Society of Natural Science, Literature, and Art," 1900-1, p. 25) that a Grebe in Mr. L. Jones' Collection, at Hilbre Island, is referable to *P. cristatus*, and not *P. griseigena* as erroneously stated in the "Birds of Cheshire," p. 249.

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## NOTE ON SOME WHITE EGGS OF THE WATERHEN

(*Gallinula chloropus*, Linn.),

By Mr. R. Newstead.

During the summer of 1903 two clutches of white eggs of the Waterhen were procured for the Society's Museum. The first clutch, consisting of seven eggs, was taken on the 17th of June; and the second clutch, of five, was taken on the 15th of July. The eggs in both clutches are irregular in shape; but more especially so are those composing the larger clutch, several of which are remarkably Grebe-like, both in form and colour. However this may be, there cannot be the slightest doubt as to the identity of the eggs, as the parent bird was seen and identified, by the writer, on both occasions. Moreover, both the nests were typical of those of the Waterhen, and were composed entirely of the leaves of sedges, and were deeply cup-shaped. Both nests were built in the same pit, among sedges, and were evidently the work of one pair of birds. No Grebes have been seen in the habitat from which the eggs were taken.

# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1903,

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

The results here given are deduced from bi-daily observations of the standard instruments, taken at 9-0 a.m. and 9-0 p.m. local mean time. Returns are sent to the Royal Meteorological Society, the Meteorological Council, the Scottish Meteorological Society, and many private observers in different parts of the Empire.

January.—A warm month, being almost 1¾ degrees above the average. The day temperature exceeded 50·0° on 10 days, and the night temperature exceeded 40·0° on four nights. Both day and night temperatures of the 25th January were fully above those of the 18th June, the uniformly high night temperatures being the principal cause. Only nine frosts in the shade, the minimum temperature being 20 0°. Rain, both as to its amount and the number of days on which it fell, was above the average, especially during the first half of the month. There were 6½ hours bright sunshine, out of a possible 8½ hours, on the 28th. A clear, sunny month, free from fog or snow, with prevailing S.-Westerly winds, only rising to a fresh breeze on three days. I would here call special attention to a very remarkable series of Januaries with high mean monthly temperatures:—1898, 7·0°; 1899, 2½°; 1900, 2½°; 1901, ¾°; 1902, 3·0°; and 1903, 1¾° above the average of the past 25 years.

February.—A very warm month, both night and day temperature being 6·0° above the average. The shade minimum only fell to 32·7° once, and was above 40·0° on 15 nights. The maximum was above 55·0° on six days. The 9th was equal in mean temperature to the 20th of August. Number of rainy days and amount of rainfall below the average, especially during the first three weeks. The prevailing wind was from the S.W., and blew a gale on five days. Snow was seen on the Welsh Hills on the 2nd. A shower of hail fell about 8 p.m. on the 1st. The temperature in the sun was above 80·0° on eight days. Bright sunshine was considerably above the average, 8·67 hours being registered on the 27th out of a possible 10·50 hours. A remarkably warm, dry, sunny, and windy month, with many overcast days.

March.—A very warm spring month, almost 4·0° above the average, principally due to the high night temperature. It only fell below 35·0° on three nights, and reached 50 0° one night. The day temperature exceeded 60·0° twice. The rainfall was excessive; with one single exception it rained every day until the 19th; rain falling on 25 days. The wind rose to the force of a gale on six days, all southerly. Lightning was seen on the 1st. Bright sunshine deficient, although 10 hours were registered on the 29th. A very warm, rather dull, and decidedly windy month.

April.—A cold month, 2½° below the average mean temperature—the mean day temperature being exactly the same as March, but the night temperature 3⅓° below it. In March the night temperature did not fall below the freezing point, while in April nine frosts in the shade were registered. The day shade temperature only twice reached 60·0°. The rainfall was a little above, and the number of days on which rain fell a little below, the average. On the 7th there was a gale from the N.W. Cloud below the average, and bright sunshine 2½% above it—on the 8th, 11·75 hours being registered out of a possible 13 hours.

May.—Exactly normal as to temperature. The minimum only once reached, 31·7°; and the maximum six times rose above 70·0°, reaching 75·8° on the 22nd. An inch more than the average amount of rain fell on four days more than the average number of rainy days for the month. Very deficient in bright sunshine, and in the temperature in the sun. Thunderstorms took place on the 1st, 2nd, and 5th. A rather quiet and very dull and sunless month.

June.—1½° below the average. The maximum day temperature only rose to 70·0° seven times, the highest being 75·8° on the 27th. An inch less

than the average amount fell on eight rainy days. Very deficient in bright sunshine; and temperature in shade much below the average. Lightning was seen on the 25th. A dull cheerless month.

JULY.—A cold, wet, dull, windy month, 1½° below the average temperature. High winds. Strong gale from the W. on the 6th. Rainfall one inch above the average, and an excessive number of rainy days. A great deficiency of bright sunshine; and temperature in the sun very considerably below the average.

AUGUST.—A very windy, dull, cold, and wet month, 1½° below the normal temperature. Three-quarters-of-an-inch excess of rainfall, and a half more than the average number of wet days. The winds almost throughout were westerly, and high, and rose to the force of a gale six times. Bright sunshine normal The maximum temperature only five times exceeded 70·0°.

SEPTEMBER.—The fourth consecutive month below the normal temperature, being ¾° short of the average, due to the low night temperatures, 32·2° being registered in the shade on the 16th. 70·0° was only twice exceeded by the maximum. An inch-and-a-half more than the average rainfall. There were 19 rainy days. Bright sunshine 7½% above the average. A gale from the W.N.W. on the 9th.

OCTOBER.—Just 3·0° above the average, due to the high night temperature, 37·5° being the lowest registered. Excess of rainfall 3·5 inches. Rain fell on 28 days—the largest number of rainy days ever registered here for any one month. My daily record of rainfall extends back 28 years. A terrific westerly gale on the 6th. Bright sunshine normal. A very warm, wet, windy, and dull month.

NOVEMBER.—½° above average temperature. Only on three nights did the minimum fall below 30·0°. Half-an-inch fully more than the average rainfall on 2·6 days above the normal number of rainy days. Gales from S.E. on 1st, and on 21st from W.N.W. More than the average bright sunshine and temperature in the sun.

DECEMBER.—½° above average temperature. On the 12th the maximum in the shade registered 58·7°, higher than on the 20th August, 55·6°. Rainfall fully an inch below the average. Bright sunshine and temperature in sun both below the average. Fog on 5th and 6th. A very dull, rather mild and dry month.

As the tables give the meteorological elements for the year 1903 only, it is desirable to add a comparison of the winter and spring months of the present year in brief.

## SHADE TEMPERATURE, AND DIFFERENCE FROM AVERAGE.

| Winter of 1903-4. | | Spring of 1904. | |
|---|---|---|---|
| December .. .. | 39·1°—0·5° | March .. .. | 41·0°—1·4° |
| January .. .. | 40·2°+1·6° | April .. .. | 48·9°+1·8° |
| February .. .. | 38·7°—1·2° | May .. .. .. | 52·1°—0·3° |
| Mean .. .. | 39·3°—0·0° | Mean .. .. | 47·3°+0·0° |

THE WINTER MONTHS.—*December* a little colder than the average; *January* about 1·6 degrees *above* the average temperature; and *February* 1·2 degrees *below* it. The slightly colder December, added to the colder February, just balance the warmer January, and give a normal winter mean.

THE SPRING MONTHS.—*March* 1·4° *below* the average, added to the cold February, still further retarded the promise of spring; cold nights, and keen easterly winds, and dull cheerless days, made it a very trying and backward spring month. *April* a warm sunny month, 1·8° *above* the average, with prevailing westerly winds, made a striking contrast to the backward March. *May* almost normal in temperature, lacking in bright sunshine, and rather wet and dull. The three *spring* months balance each other, so as to give the normal temperature for the season.

## NOTEWORTHY PHENOMENA OF 1903.

Greatest atmospheric pressure ..... 30·650 in., 14th January
Least ,, ,, ..... 28·646 in., 2nd March
Hottest day in shade ..... 82·1 degrs., 10th July
Coldest night in shade ..... 20·0 degrs., 12th January
Greatest range of temperature in 24 hours .. 31·6 degrs., 21st June
Least ,, ,, ,, .. 2·4 degrs., 20th December
Hottest day in sun ..... 124·1 degrs., 30th June
Coldest night on ground..... 13·2 degrs., 2nd December
Greatest excess of open air temperature over shade temperature, 53·9 degrs., 4th August
Greatest difference between lowest temperature in shade and on ground, 14·4 degrs., 11th June
Greatest rainfall on any one day, 1·810 inches, 27th October
Latest early Summer frost, 0·3 degrs., 12th May
Earliest Autumn frost, 2·0 degrs., 6th November
Severe gales, 6th July, 6th October
No snow fell in 1903
Thunderstorms in May, 1st, 2nd, and 5th
Greatest number of consecutive days on which rain fell: 12, 28th February to 11th March; 11, 1st to 11th May; 12, 9th to 20th August; 13, 1st to 13th September; from 1st to 27th October, except the 4th
Greatest number of consecutive days on which no rain fell: 8, in April, 8 twice in June, September, and December; 9, in May
Sunniest day of the year, 11·75 hours on 8th April, being 90·4 per cent. of the greatest possible amount
More bright sunshine in the afternoons, averaging nearly half-an-hour on each day of bright sunshine
Welsh hills at 9 a m.—These were only visible on 122 days, a little more than one-third of the year; 82 days clearly, and 40 very clearly seen

## EXPLANATIONS.

*Local Mean Time* is used for the regular observations.

*The Barometer* readings, taken at 9·0 a.m. and 9·0 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9·0 a.m., and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9 a.m. and placed to previous day.

*Ground Temperatures* read twice daily at 9·0 a.m. and 9 p.m. The lowest reading for the 24 hours, prior to 9·0 a.m., is entered to the previous day.

*Underground Temperatures* taken daily at 9·0 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew Point (as determined by Glaisher's Factors), by that corresponding to the temperature of the air (*i.e.*, the Dry-bulb reading).

*The Rain* is measured at 9 a.m., and the amount entered to the previous day. A fall of 0·006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9·0 a.m. and 9·0 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8·0 an overcast day.

The *Wind* direction is taken by means of a Compass Nephoscope, from the drift of the lower clouds.

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Ozone* read at 9·0 a.m. (according to Dr. Moffat's Scale 0—12), and placed to previous day.

*Sunshine Record.*—The photographic traces are fixed *before* being measured.

*Fog, &c.*—The fog, haze, &c., are made from the visibility of objects and lights at definite distances from Rutland Cottage.

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | Bright Sunshine. Hours ending Local Apparent Time of each Day of the Month. Forenoon. 6 | 7 | 8 | 9 | 10 | 11 | Noon | Afternoon. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Monthly. Total Hours. | Greatest possible percentage. | No. of days without. | Seasons. Hours and per-centage. | Cloud (1—10). 9 a.m. | 9 p.m. | Daily Mean. | No. of days. Over-cast. | Clear. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. ... | | | | ·25 | 4·25 | 12·49 | 14·19 | 17·17 | 10·91 | 4·34 | ·42 | | | | | | 85·65 | 31·7 | 4 | Winter 179·20 24·1% | 6·3 | 6·5 | 6·4 | 11 | 4 |
| Feb. ... | | | | 6·49 | 11·59 | 10·74 | 12·76 | 10·42 | 11·91 | 12·33 | 8·16 | 1·25 | | | | | 64·02 | 25·6 | 9 | | 8·0 | 6·5 | 7·2 | 12 | — |
| March | | | 4·49 | 12·26 | 12·00 | 11·25 | 13·09 | 15·00 | 15·73 | 16·65 | 18·42 | 10·74 | 1·66 | | | | 131·29 | 33·3 | 5 | | 8·0 | 6·6 | 7·3 | 14 | 1 |
| April... | | 0·8 | 14·37 | 15·75 | 17·83 | 18·85 | 18·13 | 19·58 | 17·33 | 17·02 | 16·43 | 14·58 | 13·33 | 2·08 | | | 185·36 | 44·7 | 3 | Spring 482·95 38·1% | 6·7 | 5·4 | 6·0 | 9 | 2 |
| May ... | 2·58 | 8·15 | 16·08 | 14·58 | 14·48 | 11·74 | 11·16 | 10·99 | 14·24 | 13·49 | 14·50 | 12·91 | 10·74 | 10·33 | ·33 | | 166·30 | 32·2 | 10 | | 7·5 | 5·8 | 6·6 | 14 | 5 |
| June ... | 4·83 | 12·81 | 16·25 | 14·74 | 15·16 | 16·82 | 14·81 | 12·75 | 16·75 | 17·66 | 15·67 | 13·49 | 11·82 | 8·66 | 2·50 | 0·8 | 194·80 | 39·0 | 2 | | 7·4 | 6·8 | 7·1 | 14 | 2 |
| July ... | 3·08 | 9·50 | 11·76 | 11·57 | 12·65 | 15·99 | 15·41 | 17·08 | 16·66 | 16·59 | 16·15 | 14·92 | 12·55 | 11·03 | 3·24 | | 188·18 | 36·0 | 3 | Summer 560·94 38·7% | 8·0 | 5·8 | 6·9 | 14 | 1 |
| Aug. ... | | 0·41 | 13·08 | 16·08 | 13·48 | 15·75 | 16·11 | 17·59 | 18·16 | 17·58 | 16·98 | 15·68 | 12·10 | 5·06 | | | 177·96 | 39·5 | 3 | | 8·0 | 7·4 | 7·7 | 13 | — |
| Sept.... | | 0·08 | 14·68 | 17·75 | 18·48 | 16·08 | 16·09 | 17·41 | 16·50 | 16·01 | 13·50 | 11·65 | 4·58 | 1·41 | | | 164·22 | 43·9 | 2 | | 7·0 | 4·1 | 5·6 | 8 | 1 |
| Oct. ... | | | 1·49 | 8·09 | 9·59 | 7·25 | 7·34 | 11·90 | 11·00 | 11·73 | 8·59 | 5·25 | 1·00 | ·58 | | | 83·80 | 26·0 | 10 | Autumn 315·16 33·6% | 8·0 | 7·5 | 7·8 | 14 | 2 |
| Nov. ... | | | | 0·25 | 6·41 | 12·16 | 14·25 | 11·90 | 11·09 | 9·25 | 1·83 | | | | | | 67·14 | 26·4 | 13 | | 6·4 | 6·0 | 6·2 | 11 | 6 |
| Dec. ... | | | | | 0·25 | 2·89 | 6·57 | 10·40 | 6·67 | 2·75 | | | | | | | 29·53 | 13·0 | 15 | | 7·5 | 7·5 | 7·5 | 18 | 3 |
| | 10·49 | 31·03 | 92·20 | 117·81 | 136·17 | 152·01 | 159·91 | 172·19 | 166·95 | 155·39 | 130·65 | 100·47 | 67·68 | 39·15 | 6·07 | 0·8 | 1538·25 | 34·7 | 79 | | 7·4 | 6·3 | 6·9 | 152 | 27 |

During Forenoon 699·62. During Afternoon 838·63.

# METEOROLOGICAL OBSERVATIONS

## RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N. ; Long. 11m. 36s. W.

MONTHLY SUMMARY OF

| | JAN. | FEB. | MARCH. | APRIL |
|---|---|---|---|---|
| PRESSURE (reduced to 32° F., and mean sea level)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 29·916in. | 30·021in. | 29·722in. | 29·892 |
| Highest reading | 30·652in. | 30·564in. | 30·294in. | 30·466 |
| ,, ,, Date of | 14 | 9 | 8 | 18 |
| Lowest ,, | 29·041in. | 29·199in. | 28·646in. | 29·262 |
| ,, ,, Date of | 9 | 27 | 2 | 29 |
| Range | 1·611in | 1·365in. | 1·648in. | 1·204 |
| TEMPERATURE in shade (Stevenson's screen)— | | | | |
| Approximate mean | 40·1° | 45·9° | 46 0° | 44·2° |
| Arithmetical ,, | 39·9° | 45·9° | 46·2° | 44·5° |
| Dry bulb (9 a.m. and 9 p.m.) mean | 39·7° | 45·6° | 44·9° | 44·4° |
| Climatological mean | 39·9° | 46·2° | 46·0° | 44·7° |
| Mean maximum | 44·7° | 51·4° | 52·2° | 52·3° |
| ,, minimum | 35·1° | 40·4° | 40·1° | 36·8° |
| Extreme maximum | 54·8° | 59·6° | 63·3° | 60·7° |
| ,, ,, Date of | 25 | 9 | 22 | 25 |
| ,, minimum | 20·0° | 32·7° | 32·1° | 26·3° |
| ,, ,, Date of | 12 | 18 | 18 | 16 |
| ,, range | 34·8° | 26·9° | 31·2° | 34·4° |
| Mean daily range | 9·6° | 11·0° | 12·1° | 15·5° |
| Maximum daily range | 19·3° | 14·7° | 17·3° | 30 1° |
| ,, ,, Date of | 5 | 24 | 11 | 25 |
| Minimum ,, | 4·6° | 3·5° | 6·0° | 6·3° |
| ,, ,, Date of | 20 & 30 | 11 | 20 | 7 |
| Number of nights at or below 32° | 9 | — | — | 9 |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 56·0° | 72·9° | 83·4° | 91·1° |
| Extreme maximum | 77 5° | 84·2° | 106·6° | 108·4° |
| ,, ,, Date of | 25 | 27 | 22 | 11 |
| Greatest excess over shade maximum | 27·2° | 35·2° | 43·3° | 51·4° |
| ,, ,, ,, ,, Date of | 28 | 26 | 22 | 11 |
| Average ,, ,, ,, | 11·3° | 21·5° | 31·2° | 38·8° |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 30·0° | 34·4° | 34·8° | 31·2° |
| Extreme minimum | 13·2° | 27·1° | 22·0° | 18·3° |
| ,, ,, Date of | 15 | 24 | 1 | 18 |
| Greatest difference from shade minimum | 11·0° | 11·3° | 13·8° | 9·8° |
| ,, ,, ,, ,, Date of | 4 | 9 | 1 & 24 | 21 |
| Mean ,, ,, ,, | 5·1° | 5·7° | 5·3° | 5·6° |
| Number of nights at or below 32° | 16 | 12 | 9 | 17 |
| TEMPERATURE underground— | | | | |
| Mean at 1 foot | 39·3° | 43·7° | 44·5° | 46·6° |
| Range ,, | 7·9° | 6·2° | 6 0° | 4·6° |
| Mean at 2 feet | 40·9° | 43·7° | 44·2° | 46·4° |
| Range ,, | 5·0° | 3·6° | 3·1° | 2·4° |
| Mean at 3 feet | 42·6° | 44·4° | 44·9° | 46·9° |
| Range ,, | 4·2° | 2·2° | 2·4° | 1·5° |
| Mean at 4 feet | 43·8° | 44·4° | 44·8° | 46·5° |
| Range ,, | 3·9° | 1·9° | 1·7° | 1·0° |
| Air temperature, 9 a.m. | 39·5° | 46·1° | 46·3° | 46·2° |
| Range of ,, ,, | 31·5° | 17·2° | 23·0° | 14 8° |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 2·375 | 1·410 | 4·085 | 2·05 |
| ,, ,, since 1st January | | 3·785 | 7·870 | 9·92 |
| Maximum fall in 24 hours | ·425 | ·305 | ·790 | ·58 |
| ,, ,, Date of | 4 | 24 | 13 | 30 |
| Number of days 0·01 fell | 18 | 12 | 25 | 12 |
| ,, ,, since 1st January | | 30 | 55 | 67 |
| Mean relative humidity, 9 a.m. | 89 | 85 | 84 | 82 |
| ,, ,, 9 p.m. | 91 | 86 | 84 | 87 |
| ,, ,, of both | 90 | 85 | 84 | 84 |
| Mean vapour pressure, 9 a.m. | ·214 | ·264 | ·261 | ·25 |
| ,, ,, 9 p.m. | ·222 | ·259 | ·240 | ·23 |
| ,, ,, of both | ·218 | ·262 | ·250 | ·24 |
| Mean dew point, 9 a.m. | 36·0° | 41·6° | 41·4° | 40·5° |
| ,, ,, 9 p.m. | 37·1° | 41·2° | 39·1° | 38·9° |
| ,, ,, of both | 36·5° | 41·4° | 40·3° | 39·7° |

# OF THE YEAR 1903.

ROAD, CHESTER.

ATMOSPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| MAY. | JUNE. | JULY. | AUGUST. | SEPT. | OCTOBER. | NOV. | DEC. | YEARLY SUMMARY. |
|---|---|---|---|---|---|---|---|---|
| 29·890in. | 30·072in. | 29·998in. | 29·773in. | 29·990in. | 29·528in. | 30·035in. | 29·703in. | 29·878in. |
| 30·470in. | 30·471in. | 30·349in. | 30·160in. | 30·569in. | 30·079in. | 30·645in. | 30·190in. | 30·652in. |
| 24 | 4 | 9 | 7 | 15 | 18 | 5 | 27 | 14 Jan. |
| 29·240in. | 29·648in. | 29·304in. | 28·950in. | 28·843in. | 28·905in. | 29·090in. | 28·896in. | 28 646in. |
| 4 | 16 | 29 | 15 | 10 | 12 | 28 | 10 | 2 March |
| 1·230in. | 0·823in. | 0·845in. | 1·210in. | 1·726in. | 1·174in. | 1·555in. | 1·294in. | 2·006in. |
| 52·1° | 56·5° | 59·2° | 58·4° | 55·7° | 51·6° | 44·5° | 39·5° | 49·5° |
| 52·6° | 57·1° | 59·8° | 58·9° | 56·1° | 51·7° | 44·5° | 39·3° | 49·7° |
| 52·5° | 56 4° | 58·9° | 58·5° | 55·1° | 50·6° | 44·2° | 38 6° | 49·1° |
| 52·4° | 57·1° | 59·9° | 59·0° | 56·1° | 51·9° | 44·6° | 39·1° | 49·7° |
| 61·0° | 66·2° | 68·2° | 66·4° | 64·4° | 57·2° | 50·0° | 43·9° | 56·5° |
| 44·2° | 48·0° | 51·4° | 51·4° | 47·8° | 46·3° | 39·0° | 34 8° | 42·9° |
| 75·8° | 75·8° | 82·1° | 73·2° | 73·9° | 64·0° | 56·9° | 58·7° | 82·1° |
| 22 | 27 | 10 | 9 | 1 | 3 & 4 | 12 | 9 | 10 July |
| 31·7° | 35·1° | 44·6° | 44·2° | 32·2° | 37·5° | 24·5° | 22·9° | 20·0° |
| 12 | 21 | 19 | 23 | 16 | 10 | 30 | 30 | 12 Jan. |
| 44·1° | 40·7° | 37·5° | 29·0° | 41·7° | 26·5° | 32·4° | 35·8° | 62·1° |
| 16·8° | 18·2° | 16·3° | 15·0° | 16·6° | 10·9° | 11·0° | 9·1° | 13·6° |
| 28·9° | 31·6° | 31·1° | 25·6° | 27·2° | 17·5° | 19·2° | 17·9° | 31·6° |
| 5 & 27 | 21 | 2 | 23 | 16 | 10 | 4 | 12 | 21 June |
| 6·5° | 9·7° | 9·9° | 3·9° | 8·3° | 5·8° | 2·7° | 2·4° | 2·4° |
| 9 | 1 | 5 | 20 | 24 & 31 | 18 | 27 | 20 | 20 Dec. |
| 1 | — | — | — | — | — | 4 | 8 | 31 |
| 95·0° | 103 6° | 106·3° | 104·7° | 95·5° | 78·4° | 63·0° | 50·2° | 83·3° |
| 14·1° | 124·1° | 118·1° | 121·6° | 117·0° | 102·0° | 80·7° | 62·1° | 124·1° |
| 27 | 30 | 1 | 4 | 1 | 2 | 4 | 7 | 30 June |
| 47·0° | 52·4° | 48·8° | 53·9° | 46·1° | 38·6° | 25·1° | 18·6° | 53·9° |
| 14 | 30 | 13 | 4 | 14 | 2 | 4 | 4 | 4 Aug. |
| 34·0° | 37·4° | 38·1° | 38·3° | 31·1° | 21·2° | 13·0° | 6·3° | 26·8° |
| 38·1° | 42·0° | 47·6° | 47·3° | 47·8° | 40·5° | 33·1° | 30·0° | 38·0° |
| 24·1° | 30·2° | 36·2° | 41·5° | 28·3° | 29·7° | 18·2° | 14·2° | 13·2° |
| 14 | 14 | 8 | 30 | 16 | 24 | 30 | 2 | 2 Dec |
| 11·7° | 14·4° | 9·2° | 12·6° | 9·8° | 14·2° | 10·5° | 10·5° | 14·4° |
| 27 | 11 | 8 | 8 | 18 | 16 | 3 | 2 & 5 | 11 June |
| 6·3° | 6·0° | 3·8° | 4·1° | 5·3° | 5·8° | 5·9° | 4 8° | 5·3° |
| 8 | 2 | — | — | 3 | 2 | 12 | 16 | 97 |
| 51·4° | 57·5° | 60·5° | 58 9° | 56·0° | 52·5° | 46·5° | 42·1° | 50·0° |
| 10·3° | 8·1° | 5·3° | 3·3° | 7·6° | 7·7° | 7·5° | 7·2° | 6·8° |
| 50·0° | 55·7° | 58 8° | 58·1° | 55·8° | 53·0° | 47·7° | 42 9° | 49·8° |
| 6·6° | 5·5° | 1·8° | 2·0° | 4·2° | 6·0° | 4·8° | 5·0° | 4·2° |
| 49·7° | 54·7° | 57·7° | 58·9° | 56·2° | 54·1° | 49·4° | 45·0° | 50·4° |
| 5·6° | 2·9° | 1·6° | 1·2° | 2·4° | 4·2° | 3·6° | 3·8° | 3·0° |
| 48·7° | 53·1° | 56·2° | 57·9° | 55·5° | 53·8° | 49·9° | 45·8° | 50·0° |
| 4·0° | 3·3° | 2·1° | 0·8° | 1·9° | 3·3° | 3·5° | 3·0° | 2·5° |
| 54·5° | 58·2° | 60·6° | 59·6° | 56·8° | 51·2° | 44·6° | 38·7° | 50·2° |
| 21·6° | 25·6° | 20·6° | 14·6° | 17·7° | 15·9° | 25·0° | 25·1° | 21·1° |
| 3·115 | 1·270 | 3·845 | 3·805 | 4·270 | 6·230 | 3·030 | 1·420 | 36·955 |
| 13·035 | 14·305 | 18·150 | 21·955 | 26·225 | 32·455 | 36·535 | 37·955 | |
| ·625 | ·350 | ·910 | ·690 | ·880 | 1·810 | ·780 | ·310 | 1·810 |
| 2 | 25 | 21 | 14 | 10 | 27 | 27 | 13 | 27 Oct. |
| 17 | 8 | 18 | 24 | 19 | 28 | 19 | 16 | |
| 84 | 92 | 110 | 134 | 153 | 181 | 200 | 216 | 216 |
| 79 | 72 | 76 | 78 | 83 | 86 | 90 | 92 | 85 |
| 88 | 83 | 85 | 86 | 92 | 92 | 91 | 93 | 87 |
| 84 | 78 | 80 | 82 | 88 | 89 | 91 | 92 | 86 |
| ·337 | ·350 | ·399 | ·400 | ·386 | ·327 | ·267 | ·216 | ·306 |
| ·318 | ·354 | ·400 | ·382 | ·373 | ·328 | ·260 | ·217 | ·299 |
| ·328 | ·352 | ·400 | ·391 | ·380 | ·328 | ·264 | ·216 | ·303 |
| 48·2° | 49·1° | 52·8° | 52·8° | 51·8° | 47·1° | 42·8° | 36·5° | 45·1° |
| 46·5° | 49·5° | 52·8° | 51·5° | 50·9° | 47·5° | 40·3° | 36·6° | 44·4° |
| 47·4° | 49·3° | 52·8° | 52·1° | 51·4° | 47·3° | 42·1° | 36·5° | 44·7° |

## WIND AND OZONE.

| | Force. | | | | | Direction to 8 Points of the Compass. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 9 p.m. | Mean. | Maximum. | Date of. | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. |
| January ... | 1·7 | 1·8 | 1·7 | 5 | 6, 28, 30 | SW | 1 | — | 1 | 5 | 10 | 16 | 12 | 1 | 16 |
| February | 2·1 | 2·1 | 2·1 | 8 | 19, 20, 28 | SW | 2 | — | — | 2 | 2 | 21 | 12 | 9 | 8 |
| March..... | 3·9 | 2·1 | 3·0 | 7 | 6 times | SW | — | — | 3 | 5 | 12 | 14 | 11 | 7 | 10 |
| April ..... | 2·0 | 1·3 | 1·7 | 8 | 7 | NW | 4 | 4 | — | 4 | 4 | 1 | 9 | 14 | 20 |
| May..... | 1·6 | 0·7 | 1·2 | 4 | 3, 15, 28 | SE | 3 | 4 | 8 | 8 | 5 | 5 | 7 | 4 | 18 |
| June ..... | 2·1 | 0·8 | 1·5 | 5 | 29 | NE | 4 | 13 | 4 | 3 | 4 | 7 | 3 | 5 | 17 |
| July ..... | 2·6 | 1·3 | 2·0 | 9 | 6 | NW | 1 | — | — | 5 | 1 | 9 | 6 | 13 | 8 |
| August ... | 3·5 | 2·0 | 2·8 | 7 | 6 times | W | 2 | — | — | 4 | — | 11 | 17 | 14 | 14 |
| September | 2·3 | 1·2 | 1·7 | 7 | 9 | S | 3 | 2 | 3 | 5 | 13 | 4 | 8 | 3 | 19 |
| October ... | 3·1 | 2·1 | 2·6 | 10 | 6 | SW | 1 | — | 2 | 7 | 7 | 17 | 13 | 7 | 8 |
| November | 1·9 | 1·7 | 1·8 | 8 | 21 | W | — | 4 | — | 6 | 2 | 4 | 10 | 14 | 20 |
| December | 1·4 | 0·9 | 1·2 | 5 | 7 | S | 1 | 1 | 4 | 9 | 9 | 8 | 4 | 1 | 25 |
| Totals ..... | 2·3 | 1·7 | 2·0 | 10 | 6th Oct. | W | 22 | 28 | 25 | 63 | 69 | 117 | 112 | 92 | 183 |
| Percentages | | | | | | | 3·1 | 4·2 | 3·5 | 8·8 | 9·7 | 16·5 | 15·7 | 12·9 | 25·6 |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | At 9 A.M. or 9 P.M. or both. | | | | | At any Hour. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dew. | Hoar Frost. | Welsh Hills, 9 a.m. Visible. Invisible | Visible. Clearly | Very clearly | Thunder Storm. | Lightning only. | Thunder only. | Corona. | Gales. | Aurora. | Snow. | Hail. | Fog. |
| January ..... | 6 | 7 | 22 | 6 | 3 | — | — | — | — | — | — | 1 | — | — |
| February ... | 6 | 2 | 11 | 12 | 5 | — | — | — | 2 | 5 | — | — | 1 | — |
| March..... | 10 | — | 14 | 11 | 6 | — | 1 | — | — | 6 | — | — | — | — |
| April ..... | 10 | — | 19 | 8 | 3 | — | — | — | — | 1 | — | — | 2 | — |
| May..... | 7 | — | 24 | 5 | 2 | 3 | — | — | — | — | — | — | — | — |
| June ..... | 5 | — | 26 | 3 | 1 | — | 1 | — | — | — | — | — | — | — |
| July..... | 7 | — | 11 | 14 | 6 | — | — | — | — | 1 | — | — | — | — |
| August ..... | 6 | — | 8 | 10 | 13 | — | — | — | — | 6 | — | — | — | — |
| September ... | 15 | — | 24 | 5 | 1 | — | — | — | — | 1 | — | — | — | — |
| October ..... | 6 | — | 23 | 8 | — | — | — | — | 1 | 1 | — | — | — | — |
| November ... | 7 | 5 | 26 | — | — | — | — | — | — | 2 | — | — | — | 5 |
| December ... | 5 | 4 | 29 | — | — | — | — | — | — | — | — | — | — | 2 |
| Total..... | 90 | 18 | 237 | 82 | 40 | 3 | 2 | — | 3 | 23 | — | 1 | 3 | 7 |

# KINGSLEY MEMORIAL PRIZES

ARE OFFERED UNDER THE FOLLOWING CONDITIONS:—

## CLASS I.

**To any Resident in the Society's District.**—A Prize not exceeding Ten Pounds for the best Collection of Objects, or Essays, or Notes of Observations, or Photographs illustrating the Natural Science of the Society's District.

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All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the Competitors.

Collections, or Essays, or Notes, must be sent to the General Secretaries on or before September 1st, and the awards will be made at the Conversazione next succeeding.

The Committee have the option of retaining successful Collections, &c., for the Society.

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## CLASS II.

**In order to encourage the study of Natural History among younger students, not exceeding 17 years of age, and residing in the Society's district, *i.e.*, Cheshire and North Wales, the following Prizes of One Guinea each are offered, viz.:—**

1.—For the best account of the Life-History of the Common Frog.

2.—For the best descriptions, with sketches and also carefully dried and mounted specimens, of *(a)* a Buttercup; *(b)* a Daisy; *(c)* a Dandelion.

3.—For the best Essay on Salt.

4.—For the four best Photographs of Natural Objects; such as: Birds, Trees, Flowers, Rocks, Clouds, or Scenery of Cheshire or North Wales.

NOTE.—All the work to be done entirely by the Competitors themselves, who must be under 17 years of age. The Essays and Collections should be sent under a *nom de plume*, accompanied by a sealed letter containing the full name and exact age of the Competitor, to the General Secretaries on or before September 1st, 1904.

The awards will be made at the Society's Conversazione next succeeding the adjudication.

The Committee do not bind themselves to give the full Prize in case of insufficient merit.

Any further information required can be had on application to the Hon. Secretaries.

# KINGSLEY MEMORIAL MEDAL

ESTABLISHED 1877,

*"For having contributed materially to the promotion and advancement of some branch or department of Natural Science."—Vide* Trust Deed.

1877—MRS. CHAS KINGSLEY (In Memoriam).
1878—JOHN PRICE, M.A.
1879—SIR PHILIP DE MALPAS GREY-EGERTON, BART., F.R.S.
1880—PROF. T. MCKENNY HUGHES, F.R.S.
1881—D. MACKINTOSH, F.G.S.
1882—ISAAC BYERLEY, M.R.C.S., F.L.S.
1883—GEORGE W. SHRUBSOLE, F.G.S.
1884—ALFRED OSTEN WALKER, F.L.S.
1885—JOHN DAVIES SIDDALL.
1886—HENRY STOLTERFOTH, M.A., M.D.
1887—WILLIAM SHONE, F.G.S.
1888—THOMAS SHEPHEARD, F.R.M.S.
1889—THOMAS RUDDY.
1890—REV. CHARLES WOLLEY-DOD, M.A.
1891—ROBERT NEWSTEAD, F.E.S.
1892—OSMUND W. JEFFS.
1893—EDMUND J. BAILLIE, F.L.S.
1894—W. MURRAY DOBIE, M.D., F.R.A.S.
1896—REV. ARTHUR H. FISH, B.A., B.SC.
1897—WILLIAM HENRY DOBIE, M.B.
1899—W. F. LOWE, A.R.S.M., F.I.C., F.C.S.
1900—JOSEPH ARKLE.
1901—THOMAS ALFRED COWARD.
1902—CHARLES OLDHAM.
1903—GEORGE P. MILN.

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# KINGSLEY MEMORIAL PRIZES,

(OF £5 AND UPWARDS)

ESTABLISHED 1877,

*"For the reward, encouragement, and the advancement of the pursuit and study of Natural Science."—Vide* Trust Deed.

| | | |
|---|---|---|
| 1878 | HELEN SMITH .....£5<br>EDWIN W. OKELL .... 5 | *Herbarium of Flowering Plants.* |
| 1879 | GEORGE SHRUBSOLE .. 5 | *Carboniferous Fossils.* |
| 1881 | E. HOPKINS ..... 5 | *Cryptogamous Plants.* |
| 1882 | GEORGE SHRUBSOLE .. 10 | *Corals of the Mountain Limestone.* |
| 1886 | ROBERT NEWSTEAD .... 10 | *Hymenoptera.* |
| 1887 | JOHN LYON DENSON .. 5 | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888 | LILIAN E. TOMLIN .... 5 | *Coleoptera.* |
| 1889 | EDITH C. TOMLIN .... 5<br>W. E. SHARP ..... 5 | *Diptera and Hymenoptera (Terebrantia)*<br>*Coleoptera.* |
| 1890 | ALFRED J. NIXON .... 10 | *Land and Fresh-Water Shells.* |
| 1892 | W. E. SHARP ..... 10 | *Coleoptera.* |
| 1896 | ALFRED NEWSTEAD £5 5s. | *Hydradephaga (Water Beetles) and Life Histories of Insects.* |
| 1897 | ALFRED NEWSTEAD £5 5s. | *Life Histories of Insects.* |
| 1900 | MISS M. BOWERS ....£5 | *Collection of Botanical Specimens.* |
| 1901 | A. E. GOODMAN ..£5 5s. | *Collection of Photo-Micrographs, with Notes and Observations.* |
| 1902 | C. THEODORE GREEN..£10 | *Collection of* 148 *Microscopical Preparations and* 170 *Herbarium Specimens of Micro-Fungi, together with a descriptive Catalogue and Essay upon same.* |

Amounts less than £5 are also awarded annually.

## Last year Junior Prizes and Certificates were awarded as follows :—

*(a) For the best Collection of dried and mounted specimens of British Grasses :—*

THOMAS E. MILN, Arnold House School, Chester .....Prize of One Guinea
(59 mounted species and descriptive list)
ELLEN HEWITT, Barnston School, Birkenhead .....Certificate of Merit
HAROLD HULME, ,, ,, ..... ,, ,,
JAMES WILLIAMS, ,, ,, ..... ,, ,,
RALPH ROBINSON, ,, ,, ..... ,, ,,

*(b) For the best Descriptive List of Insects which are Injurious to Plants in the district in which the competitor resides :—*

J. A. SIDNEY STENDALL, Grosvenor Museum, Chester ....Prize of One Guinea
(17 species of Insects)
HARRY F. PEET, Aldersey Grammar School, Bunbury ....Prize of Half-a-Guinea
(8 species of Insects)

*(c) For the best Essay on the Life-history and Habits of the Common House-Sparrow :—*

G. GORDON MILN, King's School, Chester .....Prize of One Guinea
JOHN S. THOMAS, Technical Day School, Chester .....Prize of Half-a-Guinea
CLARA ARMITAGE, Cotebrook National School, Tarporley..Certificate of Merit
LEONARD THOMPSON, Technical Day School, Chester .... ,, ,,
THOS. H. SIMCOCK, Aldersey Grammar School, Bunbury .. ,, ,,
F. B. SIMPSON, Technical Day School, Chester ..... ,, ,,
(for specimens of the Life-history of the Sparrow)

*(d) For the best Essay descriptive of the Physical Geography and Natural Features of the district in which the competitor resides :—*

PERCY HALLDING, Runcorn Technical Institute .....Prize of One Guinea

## "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Accounts for the year ended 30th April, 1904. **Cr.**

| 1903-1904. | £ | s. | d. |
|---|---|---|---|
| To Balance from last Account | 10 | 19 | 0 |
| ,, Dividends on Great Western Railway Company Consolidated Ordinary Stock | 15 | 6 | 9 |
| ,, Bank Interest..... | 0 | 1 | 2 |
| | £26 | 6 | 11 |

| 1903-1904. | £ | s. | d. |
|---|---|---|---|
| By Prizes awarded as follows :— | | | |
| Miss J. Wilkinson (Senior Prize) ..... | 3 | 3 | 0 |
| Amounts paid for Junior Prizes ..... | 5 | 5 | 0 |
| ,, Messrs. Minshull & Meeson's Account for Kingsley Memorial Certificates.. | 3 | 1 | 6 |
| ,, Miss G. M. Siddall for Designs..... | 2 | 12 | 6 |
| ,, Six new Kingsley Memorial Medals ..... | 2 | 10 | 6 |
| ,, Mr. G. R. Griffith for Printing..... | 1 | 7 | 0 |
| Balance ..... | 8 | 7 | 5 |
| | £26 | 6 | 11 |

To Balance in Bank ..... £8 7 5

*April 11th*, 1904—Examined and found correct,

GEORGE P. MILN, HON. TREASURER. JOHN DAY, AUDITOR.

# PAST PRESIDENTS

1871 to 1875—Rev. Charles Kingsley, Canon of Chester. *(Founder of the Society).*

1875 ,, 1891—Prof. T. McKenny Hughes, F.R.S.

1891-2 Alfred O. Walker, Esq., J.P., F.L.S.

1892-3 His Grace The Duke of Westminster, K.G.

1893 to 1895—W. Murray Dobie, Esq., M.D., J.P., F.R.A.S.

1895 ,, 1897—Henry Stolterfoth, Esq., M.A., M.D., J.P.

1897-8 Thomas Shepheard, Esq., F.R.M.S.

1898 to 1902—John D. Siddall, Esq.

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## SOCIETIES ASSOCIATED,

### WITH WHICH THE SOCIETY EXCHANGES PUBLICATIONS.

Academia Nacional de Ciencias de la Republica Argentina, Cordoba.

Barrow Naturalists' Field Club.

Brighton and Sussex Natural History Society.

Bristol Naturalists' Society.

British Association (Corresponding Society's Committee).

British Museum (Natural History), Cromwell Road, London, S.W.

Burnley Literary and Scientific Club

Cardiff Naturalists' Society.

Dudley and Midland Geological and Scientific Society and Field Club.

Epping Forest and County of Essex Naturalists' Field Club.

Glasgow Natural History Society.

Hertfordshire Natural History Society and Field Club.

Huddersfield Naturalists' Society.

La Société d'Histoire Naturelle de St. Wladimir á Kiew, Russie.

Leeds Naturalists' Club.

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Liverpool Geological Association.

Liverpool Literary and Philosophical Society.

Liverpool Microscopical Society.

Liverpool Naturalists' Field Club.

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Manchester Field Naturalists' Society.

Manchester Geological Society.

Manchester Microscopical Society.

Menai Society of Natural Science.

Mexico, Geological Institute of.

Northampton Natural History Society.

North Staffordshire Naturalists' Field Club and Archæological Society.

Nottingham Naturalists' Society.

Patent Office Library, 25, Southampton Buildings, Chancery Lane, London, W.C.

Scotland, West of, Marine Biological Association.

Smithsonian Institution, Washington City, D.C., U.S.A.

Southport Society of Natural Science.

The Missouri Botanical Garden, St. Louis, U.S.A.

United States Geological Survey.

University of Montana, Biological Station, Missoula, Montana, U.S.A.

University of Colorado, Boulder, Colorado, U.S.A.

University of Washington, Seattle, Wn., U.S.A.

Vatican Observatory, Rome.

Vienna Natural History Museum.

Yorkshire Naturalists' Union, Leeds.

# HONORARY MEMBERS.

*Those marked (*) have read or contributed Papers at the Society's Meetings.*

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Cannizaro, Prof. ..... .....*Rome*
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# NOTICE.

☞ **THE ANNUAL SUBSCRIPTIONS are due on the 1st of May in each year. Members who have not paid for the present year are respectfully requested to forward the amount (Five Shillings) to the Hon. Treasurer, Mr. JOHN SIMON, Chemist, 4, Eastgate Row.**

*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their names are retained on the Society's Books, and their Subscriptions considered due, until notice has been given to the contrary, according to Rule* 8.

# LIST OF MEMBERS.

*Those marked* (*) *have read or contributed Papers at the Society's Meetings.*

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Acton, Mrs. ..... Grove road, Wrexham
Adair, Major-General ..... 7 Stanley place
Adams, Mr. Beresford ..... Shirley House, Liverpool road
Adams, Mrs. ..... ,, ,,
Adams, Mr. H. Dean ..... ,, ,,
Adams, Mr. Geo. F. ..... Ashbourne, Victoria road
Ainsworth, Miss F. ..... 4 Nicholas street
Andrew, Mr. John R. ..... 18 Bold square
Andrew, Miss R. ..... ,, ,,
Andrews, Miss Edith ..... 2 West View, Dee banks
Andrews, Miss Margaret ..... ,, ,,
Ankers, Mr. W. H. ..... 6 City road
*Arkle, Mr. J. ..... Diocesan School, George street
Armstrong, Mr. Andrew ..... 25 Victoria road
Armstrong, Mrs. ..... ,, ,,
Arnold, Rev. C. L. ..... Holy Trinity Vicarage, Fareham, Hants.
Asdell, Mr. John Henry ..... 22 Hamilton street, Hoole
Ashington, Miss Lucy Yerburgh 32 Lorne street
Atkin, Mr. Chas. ..... Hoole Council Office, Hoole
Atkin, Mrs. ..... ,, ,,
Austin, Miss Ida ..... 27 City road
Ayrton, Mr. A. ..... 4 Liverpool road
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*Ballard, Mr. E. G., A.R.S.M. .. Greenfield Cottage, Hoole road
Ballard, Mrs. ..... ,, ,,

Bannister, Miss E. A. M. .....63 Foregate street
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Barber, Mr. Joseph .....83 Hoole road
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Bardsley, Mr. Richard .....St. John street, Chester
Barnes, Mr. N. F. .....Eaton gardens, Chester
Bassett, Miss C. E. .....68 Northgate street
Bate, Mr. J. C. .....Summerfield, Kilmorey park
Bate, Mrs. ..... ,, ,,
Bax, Mr. P. B. Ironside .....Blomfield, Bournemouth
*Bax, Mr. Henry J. .....Farndon
Bax, Mrs. ..... ,,
Baxter, Mr. Geo. .....Park view, Panton road, Hoole
Beauchamp, Rt. Hon. The Earl, K.C.M.G. ..... } Madresfield Court, Malvern
Beauchamp, Rt.Hon.The Countess ,, ,, ,,
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Beckett, Mrs. ..... ,, ,,
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Bennion, Mr. J. .....13 Sibell street
Bere, Miss .....6 Curzon park
Best, Rev. J. D., M.A. .....Diocesan Training College
Beswick, Miss .....Sunny bank, Queen's park
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Birch, Mr. H. J. .....Corville, Liverpool road
Birch, Miss .....18 Upper Northgate street
Bishop, Mr. F. S. .....Benrick, Dee Hills park
Bithell, Mr. W. .....Messrs. Beckett & Co., Eastgate row
Blackburn, Mrs. .....32 Bridge street row (W.)
Blackburn, Miss ..... ,, ,,
Blake, Miss .....Watergate row
Blayney, Mr. A. .....3 City Walls, W.
*Blogg, Rev. H. B., M.A. .....Frodsham Vicarage, Cheshire
Blomfield, Admiral ..... { c/o Messrs. Woodhead & Co., 44 Charing Cross, London
Blower, Mr. T. B. .....6 The Groves
Boden, Mr. Robt. W. .....Saighton lodge, Chester
Bolland, Mrs. .....46 Hough green
Bolland, Mr. Frank ..... ,, ,,
*Bonnalie, Mr. Fredk. J., L.D.S., R.C.S. ...4 Abbey square
Bonnalie, Mrs. ..... ,, ,,
Booley, Miss .....11 Lorne street
Bostock, Mrs. J. .....Kingsley Hey, Newton lane
Bourne, Mr. Harold ..... { c/o Miss Golder, 6 St. John's road, Queen's park
Bowers, Mr. J. H. .....Hawthorne villa, Hoole road
Bowers, Mrs. ..... ,, ,,
Bowers, Miss E. ..... ,, ,,
Bowles, Mrs. T. S. .....The Hollies, Liverpool road
Bowles, Miss Agnes Millicent .... ,, ,,
Boyer, Miss Edith .....2 Paradise row
Bradbury, Mr. R. P. .....Walmore, Dee banks
Bramall, Mr. G. H. .....4 Nicholas street
Brassey, Miss .....Rose hill, Bowdon, Cheshire
Brassey, Mr. Herbert .....The Limes, Curzon park
Brassey, Mrs. ..... ,, ,,
Brewer, Miss E. .....15 Paradise row

Brewer, Miss Anne .....15 Paradise row
Bridge, Dr. J. C., M.A. .....Christ Church Vicarage
Bridge, Mrs. ..... " "
Bridge, Miss ..... " "
*Broadbent, Mrs. .....Bache Cottage
Brown, Miss L. E. .....The Folly, Flookersbrook
*Brown, Mr. F. F., M.A. .....Eastgate row
Brown, Miss .....61 Bouverie street
Brown, Miss Daisy ..... " "
Brown, Mr. W. E. .....33 Parkgate road
Brown, Mrs. ..... " "
Brown Mr. W. Ernest ..... " "
Brown, Mrs. H. T. .....Westminster avenue, Hough green
Buchan, Mr. Alex., F.I.C. .....19 Eastgate row
Buckland, Miss .....31 Nicholas street
Bull, Mr. H. F.....4 Sunny Bank, Queen's park
Bull, Mrs. ..... " "
Burges, Miss J. V. .....Whitford, 11 Panton road, Hoole
Burges, Miss L. O. ..... " " "
Burness, Mr. Wm. .....Parr's Bank, Ltd., Chester
Butcher, Mr. Jas. .....19 Seller street
Butterworth, Mr. Robt. .....35 Bouverie street

*Caldecott, Mr. C. G. .....King street, Wrexham
Caldecott, Miss C. G. .....68 Gladstone road
Cameron, Mr. J. S. .....37 Hoole road
Campbell, Mrs. Pitcairn .....Vicar's Cross, Chester
Campbell, Mr. A. D. Pitcairn.... " "
Carr, The Hon. Mrs. .....14 Hough green
Carr, Mrs. Thos. .....Fuller's Moor, Broxton
Carter, Mr. T. .....Chemist, Boughton
Catherall, Mr. Samuel .....1 Linenhall street
Challinor, Mr. R. .....34 Eaton road
Chalton, Mr. T. W. .....Wynstay, Hoole, Chester
Chalton, Mrs. ..... " "
Chapman, Mr. F. W. .....46 Tarvin road
Chapman, Mrs. ..... " "
Chapman, Mr. M. D. .....59 Tarvin road
*Chester, The Right Rev. The Lord Bishop of ..... } The Palace, Dee side
Chidley, Mr. T. .....14 St. Werburgh street
Churton, Mrs. G. .....96 Watergate flags
Clark, Mr. Sidney.....Upton Villa
Clark, Miss Sybil .....Stanley house
Clark, Miss .....19 Grosvenor street
Clark, Miss Eva ..... " "
Clarke, Mr. John .....Pasadena, Liverpool road
Clarke, Mr. W. J. .....The Beeches, Upton park
Clarke, Mr. Ernest ..... " "
Clare, Mr. Horatio .....Grosvenor Schools, Chester
*Clay, Miss Beatrice E., B.A. ....The Queen's School
Clayton-East, Mr. G. F. L. ....Bache Hall Lodge
Clayton, Miss Bianca .....17 Vicarage road, Hoole
Clemence, Mr. S. .....2 Chichester street
Clemence, Mr. Thos. .....56 Hough green
Clough, Mr. G. F. .....78 Hough green
Cochrane, Mr. J. G. .....9 Grange road, Brook lane
Cockrill, Mr. C. P. .....Briercliffe, Hough green
Cockrill, Mrs. ..... " "
Coe, Mr. D. .....Howard lodge, Hamilton street
Coe, Mr. Henry J. .....18 Queen's avenue
Collinge, Mr. James.....Kinnerton Lodge, Chester

Collins, Mrs. .....The Grosvenor Hotel
Coltart, Mr. C. B.....23 Hough green
Connah, Mr. Jas. .....Laboratory, Custom House, London, E.C.
Conway, Mr. Walter .....8 and 10 Old Bank buildings
Conyers, Mr. W. R. .....33 Tarvin road
Cook, Mr. G. Mark .....110 Foregate street
Cook, Mr. R.....7 The Groves
Cook, Miss Alice M. ..... ,, ,,
Cooke, Mr. J. H. .....6 Queen street
Coppack, Mr. Chas. .....Gladwyn, Liverpool road
Coppack, Miss ..... ,, ,,
Coppack, Miss Nellie ..... ,, ,,
Cordery, Miss C. .....St. Agnes' School, Caldy, West Kirby
Crane, Mr. H. E. .....Savings Bank House, Grosvenor street
Cresswell, Mrs. .....8 Ashgrove, Wrexham road
Cresswell, Miss ..... ,, ,,
Cresswell, Mr. F. P.....7 Sydney road, Garden lane
Cresswell, Mrs. ..... ,, ,,
Crimes, Mr. W. H. .....167 Boughton
Crow, Mr. John.....The Waterworks, Chester
Cullimore, Mrs. .....Christleton, Chester
Cullen, Mr. W. H. .....Weston Point, Queen's park
*Cummings, Mr. Sidney G. .....6 King's buildings

*Darby, Very Rev. J. L., D.D. ..The Deanery
Darby, Mrs. ..... ,,
Darby, Miss ..... ,,
Darby, Mr. Alfred .....Ashgrove, Grosvenor road, Wrexham
Davies, Miss Henrietta .....69 Boughton
Davies, Mr. E. Henry .....19 Francis street
Davies, Mr. Joseph ..... ,, ,,
Davies, Mr. John .....Parr's Bank, Limited, Chester
Davies, Mr. W. L. .....Beechwood House, Canal street
Davies, Mrs. ..... ,, ,, ,,
Davies, Rev. J. T., M.A. .....6 Abbey green
Davies, Mr. W. L. Cameron ....Victoria pathway, Queen's park
Davies, Mrs. ..... ,, ,,
Davies, Mr. Percy Twiston.....Cedar Bank, 16, Liverpool road
Davison, Mr. J.....60 Liverpool road
Davison, Mrs. ..... ,, ,,
Davison, Mr. George .....4 Chichester street
Day, Mr. John .....Bryntirion, Chichester street
Day, Mrs. ..... ,, ,, ,,
Day, Miss ..... ,, ,, ,,
Day, Mr. George .....Eastgate street
Delany, Mr. John .....7 Lorne street (South)
Delany, Mrs. ..... ,, ,,
Dennis, Miss Ada .....47 Nicholas street
Denson, Mr. W. .....21 Upper Northgate street
Denson, Mrs. ..... ,, ,,
Denson, Miss Adelaide ..... ,, ,,
Denson, Mr. J. Lyon ..... ,, ,,
Denson, Mr. W. H. .....Westminster avenue, Hough green
Denson, Mrs. ..... ,, ,, ,,
Denson, Mr. F. R. .....Abbot's Mount, 33 Liverpool road
Denson, Mrs. ..... ,, ,, ,,
Dew, Mr. W. R. ..... c/o Messrs. Douglas & Minshull, 6 Abbey square
Dickinson, Mr. D.....1 Upton view, Hoole
Dickinson, Mrs. ..... ,, ,,
Dickson, Mrs. T. Campbell.....8 Waterloo road
Dickson, Mr. Geo. A., J.P. ....Springfield, Flookersbrook

Dickson, Mr. J. H. .....St. Ives, Queen's park
Dickson, Mrs. ..... ,, ,,
Digby, Miss .....2 Grey friars
Digweed, Mr. Chas. S. ..... 2 Panton road, Hoole
Dixon, Mr. Phillip .....10 Nicholas street
*Dobie, Dr. W. M., F.R.A.S., J.P...4 Hunter street
*Dobie, Mr. W. H., M.B. .....2 Hunter street
Dobie, Mrs. ..... ,,
*Dobie, Dr. Herbert .....11 St. John street
Dobie, Mrs. ..... ,, ,,
Dobie, Mr. Douglas .....12 Upper Northgate street
Dobson, Pastor R. ..... 2 Pyecroft street, Handbridge
Dod, Miss Wolley.....Edge Hall, Malpas
Dodd, Mr. W. ..... Mayfield Cottage, 7 Vicarage road, Hoole
Dodd, Mr. Henry ..... ,, ,, ,,
Dodd, Mr. John .....35 Saughall road
Dodds. Mr. Arthur W., L.D.S.E...Thornleigh, 3 Westminster park
Donald. Mrs. .....The Cross
Douglas, Mr. C. P. .....St. Martin's House
Douglas, Mrs. ..... ,, ,,
Dowdall, Colonel A. P. .....25 Curzon park
Dowdall, Miss A. ..... ,, ,,
Drinkwater, Dr. ..... ....Wrexham
Ducker, Mr. P. J. ..... George street
Duckworth, Mr. Henry, F.L.S., F.G.S...7 Grey friars
Duff, Dr. ..... .....5 Abbey street
Dufton, Mr. Arthur, M.A., B.Sc...5 Eversley park
Dufton, Mrs. ..... ,, ,,
Duke, Col. A. W., R.A.M.C. ..Montrose house, Hough green
Dutton, Mr. George F. .....Aldersey Grammar School, Bunbury, Tarporley
Dutton, Mrs. G. W. .....Claremont, Vicar's Cross, Chester
Dutton, Mr. H. B. .....Freshfield, 27 Curzon park
Dutton, Mrs. .. ..... ,, ,,
Dutton, Mr. Stanley Gordon .... ,, ,,
Dutton, Miss M. .....11 Grosvenor road
Dutton, Mr. A. E. .....51 Frodsham street
Dutton, Mr. John .....Littleton Hall Gardens
Dye, Mr. Alfred B. .....Fairhazel, 30 Bouverie street
Dye, Miss Ethel ..... ,, ,,

Ealand, Mrs. .....Hovendene, Dee Hills Park
Ealand, Mr. A. N. ..... ,, ,,
Edwards, Mr. Charles .....Dodleston, near Chester
*Edwards, Mr. F. G., F.R.C.V.S...5 Newgate street
Edwards, Rev. Frank, M.A. ....St. Paul's Vicarage
Edwards, Mrs. ..... ,, ,,
Edwards, Mrs. .....59 Tarvin road
Edwards, Mrs. E. Lloyd .. ....Bryn Oerog, near Llangollen
Eddy, Miss E. .....29 Bouverie street
Eggers, Miss ..... .....42 Hough green
Eggington, Mr. R. H. .....32 St. Martin's fields
Eggington, Mrs. ..... ,, ,,
Elliott, Dr. John, B.S., B.Sc.....24 Nicholas street
Elliott, Mrs. ..... ,, ,,
Ellis, Mr. R. J. .....60 Foregate street
Elphick, Mr. G. Pelham .....Brook lodge, Brook lane
Elphick, Mrs. ..... ,, ,,
Ermen, Mr. C. A. .....3 City Walls (West)
Evans-Lloyd, Col., J.P. .....Stanley house
*Evans, Mr. F. .....The Eastgate
Evans, Mr. Geo. H. .....The Limes, Lumley road

Evans, Miss .....Roseneath-on-the-Hill, Bwlchgwyn, near Wrexham
Evans, Mrs. .....54 Watergate street
Evans, Miss E. M. ..... ,, ,,
Evans, Miss Maria .....49 Cheyney road
Evans, Miss Emily ..... ,, ,,
Evans, Mr. A. H. .....St. George's crescent, Queen's park
Evans, Mrs. ..... ,, ,, ,,
Ewens, Mr. A. .....32 King street
Ewing, Mr. C. A. .....Rockcliffe, Queen's park
Ewing, Miss Alice Mabel ..... ,, ,,
Ewing, Mr. Ch. G. ..... ,, ,,
Ewing, Master J. Cecil R. ..... ,, ,,

Farmer, Mr. Richard .....56 Liverpool road
Farrimond, Mr. F. T. .....Sunnyside, Boughton
Fergusson, Mr. W. .....The Cairn, Liverpool road
Fergusson, Miss J. M. ..... ,, ,,
Ffoulkes, Mr. Thomas B., Junr. .8 Burlington road, Ipswich
Ffoulkes, Mr. Geo. B. .....15 Chichester street
Ffoulkes, Miss Jocelyn.....Kingsley lodge, Liverpool road
Ffoulkes, Miss H. Jocelyn ..... ,, ,,
Finchett-Maddock, Mrs. H. ....Cae Gwyn, Carnarvon
Fish, Mrs. .....Arnold house, Parkgate road
*Fish, Rev. A. H., B.A., B.Sc. .. ,, ,,
Fish, Mr. Cecil E., B.A., M.B., B.C. (Camb.), M.R.C.S., L.R.C.P. (Lon.) } Llanbedr Hall, Ruthin, N. Wales
Fitz-Gerald, Dr. W. A. .... ...Clare lodge, Chester
Fleming, Mr. T. R. .. .....Rowton Grange
Fleming, Mrs. ..... ..... ,, ,,
Fletcher, Miss .....Gleneden, Curzon park
Float, Mrs. S. M. ..... .....20 Upper Northgate street
Fluitt, Miss .....25 Upper Northgate street
Forster, Mr. W. Angus .....Belgrave lodge, Pulford
Franks, Miss .....11 City Walls (South)
Fraser. Mr. R. .....Greenbank, Eaton road
Fraser, Miss ..... ,, ,,
Frater, Mr. Geo. .....Grey Holt, Summerhill, near Wrexham
Frater, Mrs. ..... ,, ,, ,,
Freeman, Mr. C. E. .....Branksome, Brook lane
Freeman, Mrs. ..... ,, ,,
Frisby, Miss .....16 Chichester street
Frost, Lady .....Redcliff, Queen's park
Frost, Mr. J. G., J.P. .....Boughton Hall
Frost, Mrs. ..... ,, ,,
Frost, Mr. J. M., J.P. .....Upton Lawn
Frost, Mrs. ..... ,, ,,
Frost, Mr. T. Gibbons .....Mollington Banastre
Frost, Mrs. ..... ,, ,,

Gamon, Mr. John .....The Quilletts, Liverpool road
Gardner, Mr. E. .....9 Abbey street
Gardner, Mr. F. J. .....35 Granville road, Cambrian view
Garnett, Mrs. .....The Rectory, Christleton
Garnett, Mr. J. W. .....45 Bridge street row
Garnett, Mrs. ..... ,, ,,
Garside, Mr. Franklin .....14 Bouverie street
Garside, Mrs. ..... ,, ,,
Garside, Miss ..... ,, ,,
Gerrard, Miss .....Fuller's moor, Broxton
Gibson, Major .....Buckley, *via* Chester
Gibson, Miss .....2 Paradise row

Gibson, Mr. John .....5 Abbot's nook, Victoria road
Giffen, Mr. J. T. M., F.R.C.S. ..Richmond Hill, Boughton
Gilbert, Mr. Egerton .....21 Eaton road
Gilbert, Mrs. ..... " "
Giles, Mr. E. S.....Gowymede, Vicar's Cross
Giles, Mrs. ..... " "
Glascodine, Miss .....4 King's buildings
Gleadowe, Mr. H.....11 Stanley place
Golder, Mr. Jas. T. .....36 Hough green
*Goodman, Mr. A. E. .....Oakdene, Tarvin road
Goodman, Mrs. W. ..... " "
Goodhart, Mrs. E. S. .....100 Watergate flags
Gordon, Miss F. F. .....The Limes, 54 Hough green
Gore, Ven. Archdeacon, D.D. ..Bowdon, Cheshire
Gourlie, Rev. N. J. N., M.A.....Brook House, Cambrian view
*Granger, Mr. F. M., M.R.C.S., L.R.C.P...18 Nicholas street
Grantham, Rev. H. .....S. Mary's Rectory
Grantham, Miss Gwynydd ..... " "
Gray, Miss .....6 Lorne street
Greenhouse, Mr. Chas.....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S., M.B.M.S. } 31 Shrewsbury road, Birkenhead
Greig, Mrs. .....Anfield, Dee banks, West
Griffin, Rev. T. A. .....16 Deva terrace
Griffith, Mr. G. R. .....Grosvenor street
Griffith, Mr. G. B. ..... .....Rose Villa, 11 Eaton road
Griffith, Mr. W. R. .....Rydal Mount, Upper Bangor, N. Wales
Griffiths, Mr. John .....Elmhurst, 1 St. John's road, Queen's park
*Griffiths, Rev. T. T., M.A..... " " "
Griffiths, Mr. Robert .....West hey, Hough green
Griffiths, Mrs. ..... " "
Griffiths, Miss Bessie ..... " "
Griffiths, Mr. R., Junr. ..... " "
Griffiths, Mr. W. A..... .....20 Prince's avenue
Griffiths, Mrs. ..... " "
Griffiths, Mr. John .....The Hollies, Upton park
Grindley, Mr. J. .....3 Eastgate street
Gritton, Mr. Joseph ..... .....The Laurels, Hawarden
Grills, Dr. .....The Asylum, Chester
Gunton, Miss.....2 Church street

Hallmark, Miss Amy .....2 Waterloo road
Hales, Miss .....Cop house, Sealand road
*Hamilton, Mr. A., M.R.C.S.....16 White friars
Hamilton, Mrs. ..... "
Hamilton, Mr. A. G., M.B. ....23 Hoole road
Hamilton, Mrs. ..... "
Hampson, Mr. R.....Halkyn road, Flookersbrook
Hannon, Miss .....15 Victoria pathway, Queen's park
Harris, Mr. T. .....Claremont, Dee banks
Harris, Mrs. ..... " "
Harrison, Mrs. .....Highfield, Curzon park
Harley, Mr. T. D.....21 Blacon terrace
Harvey Miss .....Fern Lea, Stamford Bridge, nr. Chester
Haswell, Mr. G. H. ..... .....Queen's park
Haswell, Mrs. ..... " "
Haswell, Mr. W. H. .....94 Foregate street
Haswell, Mr. Geo. W.....28 Bouverie street
Haswell, Miss F. E. ..... .....31 Parkgate road
*Hawkins, Mr. J. M. .....Glan Aber park
Haycock, Rev. H. E. .....59 Parkgate road
Henderson, Mr. J. E. .....19 Pathway, Queen's park

Henderson, Mrs. .....Union Walk, Chester
Henri, Miss .....11 Queen's road, City road
Henshall, Mr. James, Junr. ....22 Bouverie street
Heppel, Miss .....16 Hough green
Heppel, Mrs. .....Windsor Lodge, Mickle Trafford
*Hetherington, Mr. T.....Engineers' Department, The Post Office, Glasgow
Hewitt, Mr. D. L. .....Abbey House, Northgate street
Higgins, Miss Eva .....The Manor, Overleigh
Higgins, Miss Millie..... " "
Higginson, Mr. T. .....7 South view, Eaton road
Hignett, Mrs. .....28 Hough green
Hignett, Mrs. T. H. .....Shandon, Hough green
Hignett, Mr. H. Napier ..... " "
Hilton, Mrs. .....Talbot Hotel
Hincks, Mr. J. W. .....Brantwood, Brook lane
Hincks, Mrs. ..... " "
Hobday, Mr. J. .....Alexandra Villa, Liverpool road
Hobday, Mr. E. ..... " "
Hobday, Mr. Wm. Edward.....22 The Groves
*Hodges, Mr. W. .....62 Hough green
Hodgson, Mr. Wm. W. .....65 Northgate street
Hodkinson, Mrs. .....39 White Friars
Hodkinson, Mr. E. ..... " "
Hogarth, Mr. T. O. .....The Lodge, Saltney
Holland, Miss .....11 Derby place, Hoole road
Holland, Miss ..... { c/o Miss Perry, Northdene, Upper Northgate street
Holland, Mr. W. .....Ashwood, Queen's park
Holland, Mrs. ..... " "
Hollis, Rev. Thomas .....18 Eaton road
Hollis, Mrs. ..... " "
Holme, Rev. Canon, M.A.....Great Budworth, Northwich
Holmes, Mr. J. G., J.P. .....Belmont, Curzon park
Holmes, Mr. A. T. .....Ashcroft, 27A Hough green
Holme, Mr. Samuel H. .....Downswood, Liverpool road
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopkinson, Mr. Harry.....55 Parkgate road
Hopley, Mr. J. H .....6 Northgate street
Hopley, Mrs. ..... " "
Hopton, Mrs.....8 Moss bank, Parkgate road
Hopwood, Miss.....The Deanery
Hornby, Mr. Alex. ..... .....Woodville, Brook lane
Hornby, Mrs ..... " "
Horner, Mr. W. .....42 Grey Rock Street, Liverpool
Hostage, Mr. George B. .....30 Eaton road
Hostage, Mrs. ..... " "
Hostage, Miss .....24 Eaton road
Howson, Rev. J. F., M.A. .....Egerton House, Upper Northgate Street
Howson, Miss ..... " " "
*Howe, Rev. W. Norton, M.A. { 84 Margaret street, Cavendish square, London, W.
Howick, Mr. T. S. Keith .....22 St. Martin's fields
Hughes, Mrs. McKenny .....18 Hills road, Cambridge
Hughes, Mr. John .....47 Victoria street, Westminster, London
Hughes, Miss.....Wepre Cottage, Connah's Quay
*Hughes, Mr. T. Cann, M.A., F.S.A..78 Church Street, Lancaster
Hughson, Mr. Arthur .....Surveyor, Mollington, Chester
Humberston, Miss .....Newton Hall
Humphreys, Mr. E. Noel .....Caer-y-Cael, Hoole
Humphreys, Mrs. ..... " "
Hunter, Mr. Jas. .....Maisonette, Hough green
Hunter, Mrs. ..... " "

Hunter, Mr. S. F. .....Maisonette, Hough green
Hunter, Mr. Jas. de Graaff .....Pembroke College, Cambridge
Hutton, Mr. F. W. .....53 Greenway road., Runcorn
Huxley, Miss M. E. .....41 Cheyney road
Huxley, Miss Ann ..... ,, ,,

Illingworth, Mr. F. H. .....34 Liverpool road
Illingworth, Mrs. ..... ,, ,,

Jack, Mr. A. S. .....Belle Vue, 72 Hough green
Jackson, Miss .....52, Hough green
James, Rev. T. D. .....Llanerfyl Rectory, Welshpool
*James, Rev. Frank, M.A. .....Rossett Vicarage, near Wrexham
James, Mr. J. F. .....17 Mount Pleasant, Saltney
*Jebb, Mr. G. R., C.E... .....Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S. } 2 The Northgate
Jenner, Mr. H. A. .....11 White Friars
*Johnson, Mr. M., L.D.S.I. .....21 York villas, Lorne street
Johnson, Mr. Thomas C. .....30 Eastgate row
Johnson, Mr. Noel .....Warwick Road Hall, Bowdon
Johnson, Mr. Sidney M. .....18 Bouverie street
Johnson, Mrs. Mayo .....10 Lorne street
Jolliffe, Mr. H. D. .....Kilbroney, Curzon park
Jones, Miss .....3 Lorne street
Jones, Mrs. Edward .....c/o Mr. E. B. Jones, Greyfriars
Jones, Mr. Jno. .....The Spinney, Hunter street
Jones, Mrs. ..... ,, ,,
Jones, Mr. David Brellisford ....11 St. Anne street
Jones, Mr. Owen E., J.P. .....Tynrheol, Amlwch
Jones, Mr. Fred. .....112 Foregate street
Jones, Miss .....2 Hunter street
Jones, Mrs. W. H. .....Cliveden, Hough green
Jones, Miss Gertrude A. ..... ,, ,,
Jones, Mrs. Evan .....Bodrenig, Bala, N. Wales
Jones, Mrs. Wm. .....33 Cuppin street
Jones, Mr. Henry .....Gwynedd, 131 Boughton
Jones, Mr. O. R., H.M.I.M. ....5 Spring Gardens, Hoole
Jones, Mr. Robert W. .....Cambrian view
Jones, Miss Mima .....3 Eastern pathway, Queen's park
Jones, Mr. Charles .....50 Princess street
Jones, Mr. W. B. .....The Post-office, Hawarden
Jones, Mr. A. E. .....1 Eastern pathway, Queen's park
Joyce, Rev. G. C., M.A. .....St. Deiniol's Hostel, Hawarden
Joyce, Rev. F. Hayward .....9 Abbey square

Kelsall, Miss H. .....Abbot's court, Liverpool road
*Kennedy, Mr. J. B. .....Dee Bank House
Kenyon, Mr. G. A., M.B. .....Flookersbrook
Kenyon, Mrs. ..... ,,
Kember, Miss M. .....8 The Groves
Killick, Mr. George .....Eaton, Chester
Killon, Mr. R. W. .....16 Egerton street
Killon, Mrs. ..... ,, ,,
Kirkby, Miss .....Fircroft, Hough green
•King, Dr. H. W. .....26 Nicholas street
King, Mrs. ..... ,, ,,
•Kingsley, Miss .....Keys, Eversley, Winchfield
Knight, Miss .....8 Eastgate row
Knowles, Mr. E. R. .....15 Grosvenor street
Knowles, Miss ..... ,, ,,
Kynnersley, Mr. E. M. Sneyd ..Boughton Lodge

Lacy, Mrs. .....Moore Holme, Neston
Laing, Miss S. C. .....27 Chester street, Saltney
Lamb, Mr. R. .....Oak Lea, Hoole
Lamb, Mrs. ..... " "
Lamb, Mr. R., Junr. .....Yrfon, Granville road
Lamb, Mrs. ..... " "
Lamont, Mr. A. .....6 Greyfriars
Lanceley, Mr. R. H. .....Victoria road
Latham, Mr. J. S. .....Green bank, Liverpool road
Latham, Mrs. ..... " "
*Lawrence, Dr. A. .....The Asylum, Chester
Lawson, Mr. J. A. .....57 Egerton street
Laybourne, Mr. J. H. .....21 The Groves
Laybourne, Mrs. ..... " "
Ledsham, Mr. G. .....Green lane, Tarvin road
Ledsham, Mr. Wm. .....Coal Exchange
Lees, Mr. W., M.R.C.S. .....The Bars
Lewis, Rev. J. S., M.A. .....The Vicarage, Ruabon
Leysaght, Colonel .....Watergate House
Lloyd, His Honour Sir Horatio ..8 Stanley place
Lloyd, Mr. F. Horatio ..... "
*LLoyd, Colonel Wilford .....Eccleston Hill, Chester
LLoyd, Mrs. ..... " "
Lloyd, Miss M. E. .....13 Chichester street
Lloyd, Miss C. .....62 Princess street
Lloyd, Mr. G. .....38 Duke street
Lloyd, Mr. W. H. .....Glenhurst, Hoole road
Lloyd, Mr. T. F. ..... " "
Lockwood, Mrs. .....7 Queen's park
Lockwood, Miss Amy .....90 Foregate street
Lodge, Mr. Geo. T. .....St. Catherine villa, Lord street
*Longbottom, Mr. F. W. .....Haslemere, Queen's park
Longbottom, Mrs. ..... " "
Lowe, Miss C. H. .....Onneley House, Liverpool road
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MDCCCCIV.

NATURAL HIST

# CHESTER SOCIETY
## of
# NATURAL SCIENCE LITERATURE & ART

FOUNDED BY CHARLES KINGSLEY
1871

# THIRTY-FOURTH ANNUAL REPORT & PROCEEDINGS

FOR THE YEAR

1904-1905.

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*Special attention is directed to the List of Lepidoptera found in Cheshire, Flintshire, Denbighshire, Carnarvonshire, and Anglesea (Proceedings No. V.), which has recently been published by the Society. Copies may be obtained from the Curator, at the Museum, price 2/6 each (Post free 2/8).*

# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY 1871).

## THIRTY-FOURTH

# ANNUAL REPORT

INCLUDING

## STATEMENT OF ACCOUNTS, &c.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art, by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Eight Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules :—

4.—The name of any Candidate for Membership of the Society, with those of a Proposer and a Seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

7.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each —except to the Annual General Meeting, to which Members only are admitted.

8.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

9.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

10.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

11.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

12.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

13.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

14.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement made up to the end of April, and duly audited, shall also be submitted, and read if desired.

15.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

16.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

17.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

18.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1905-1906.

## President:

REV. A. H. FISH, B.A., B.Sc.

## Vice-Presidents:

PROF. T. McKENNY HUGHES, F.R.S. | H. STOLTERFOTH, ESQ., M.A., M.D., J.P.
A. O. WALKER, ESQ., J.P., F.L.S. | T. SHEPHEARD, ESQ., F.R.M.S.
W. M. DOBIE, ESQ., M.D., J.P., F.R.A.S. | G. R. GRIFFITH, ESQ.
J. D. SIDDALL, ESQ.

## Officers of Sections:

### BOTANICAL.

CHAIRMAN—MR. J. D. SIDDALL ... ... ... ... 23, *Eaton Road*
SECRETARY—MR. A. E. GOODMAN ... ... ... *Oakdene, Tarvin Road*

### ZOOLOGICAL.

CHAIRMAN—DR. W. HENRY DOBIE ... ... ... 2, *Hunter Street*
SECRETARY—MR. W. F. J. SHEPHEARD, F.C.S. ... *Bridge Street Row*

### GEOLOGICAL.

CHAIRMAN—MR. A. W. LUCAS, F.G.S. ... ... ... *Queen's Park*
SECRETARY—MR. EGERTON GILBERT ... ... ... 21, *Eaton Road*

### NATURAL PHILOSOPHY.

CHAIRMAN—MR. G. WATMOUGH WEBSTER, F.C.S. *Grange Road, West Kirby*
SECRETARY—MR. J. BAIRSTOW, F.C.S.... ... ... *Burley, Queen's Park*

### MICROSCOPICAL.

CHAIRMAN—DR. STOLTERFOTH ... ... ... ... 1, *Grey Friars*
SECRETARY—MR. M. JOHNSON, L.D.S.I. ... ... 21, *York Villas, Lorne Street N.*

### PHOTOGRAPHIC.

CHAIRMAN—DR. STOLTERFOTH ... ... ... ... 1, *Grey Friars*
SECRETARY—MR. FRANK SIMPSON ... ... ... 10, *Grosvenor Street*

### LITERATURE.

CHAIRMAN—REV. A. H. FISH, B.A., B.Sc. ... ... *Arnold House*
SECRETARY—DR. J. T. ROBERTS ... ... ... ... *Dorchester House*

### ASTRONOMICAL.

CHAIRMAN—DR. W. M. DOBIE ... ... ... ... *Hunter Street*
SECRETARY—MR. F. W. LONGBOTTOM ... ... *Haslemere, Queen's Park*

### ART.

CHAIRMAN—THE VERY REV. DR. DARBY ... ... *The Deanery*
SECRETARY— ... ...

## Hon. Treasurer:

MR. JOHN SIMON, 4, *Eastgate Row.*

## Hon. Secretaries:

*Scientific*—DR. STOLTERFOTH, M.A., 1, *Grey Friars.*

*General*—MR. G. P. MILN, *Milnholme, Brook Lane*; MR. W. F. J. SHEPHEARD, F.C.S., *Bridge Street Row*

## Hon. Librarian:

MR. ALFRED NEWSTEAD, *The Grosvenor Museum.*

## Committee:

THE ABOVE OFFICERS *(Ex-officio)* AND

MISS BEATRICE CLAY, B.A. | DR. KING
REV. J. L. BEDFORD, M.A., F.L.S. | MR. J. A. McMICHAEL, B.A., B.Sc.
MR. J. DAY | MR. R. NEWSTEAD, A.L.S., F.E.S.
MR. J. LYON DENSON | MR. W. SHONE, F.G.S.
DR. GRANGER | DR. JAMES TAYLOR
DR. HAMILTON | MR. J. R. LE B. TOMLIN, M.A., F.E.S

## Hon. Auditors:

MR. BERESFORD ADAMS. MR. E. NOEL HUMPHREYS, C.A.

## Curator:

MR. ALFRED NEWSTEAD, *The Grosvenor Museum.*

## Assistant Secretary:

MR. H. NEW.

## Representatives of the Society upon the Grosvenor Museum Management Committee.

REV. A. H. FISH, B.A., B.Sc. | MR. G. P. MILN | MR. J. BAIRSTOW, F.C.S.
MR. J. D. SIDDALL | MR. JOHN SIMON | MR. F. W. LONGBOTTOM

## HON. SECRETARIES' REPORT.

In presenting the Thirty-fourth Annual Report, your Committee have pleasure in announcing a further increase in the membership of the Society.

Since the last Annual General Meeting 112 Members have joined the Society; and, although the losses by deaths, removals, and resignations, amount to 95, there has been a nett increase of 17; making a total of 1,028 members at present.

The finances of the Society are also in a satisfactory condition. The adverse balance of £8 15s. 5d. from last year's account has been cleared off, and after meeting all liabilities, the Treasurer has been able to carry forward the sum of £5 0s. 4d. towards next year's account.

The attendance at the General and Sectional Meetings during the past year has been well-maintained, and there is every evidence that these are growing in popularity and usefulness. A very pleasing feature is the increasing number of younger members who attend these Meetings; and your Committee trust, that many of these will, in the course of time, become active workers in the various branches of Natural Science.

On the other hand, the Excursions and Field Meetings again show a slight falling-off, although every effort has been made to render them more popular.

The Conversazione was again held in the Town Hall, and proved to be very successful, both as regards the Exhibits, and the largely increased attendance of members and friends.

In conjunction with the Archæological Society, the work of furnishing and fitting up the Library has been successfully carried out at a cost of £188 14s. 11d. Subscriptions to the extent of £179 1s. 6d. were received, so that the actual expense to the Society represents only a very small sum.

The Society's Books are now placed in the Library, and the Room may be used under Rules which have been drawn up in conjunction with the Archæological Council, and which are printed in this Report.

Your Committee wish, in conclusion, to place on record their deep sense of the loss which the Society has sustained by the resignation of its esteemed Curator (Mr. Robert Newstead), consequent upon his appointment to a Lectureship in the Liverpool School of Tropical Medicine.

Of the long and devoted service which Mr. Newstead has rendered to the Society in general, it is impossible to speak adequately here. But the Committee and Officers of the Society feel that they may appropriately take this opportunity of expressing, personally and collectively, their own grateful sense of the immense help which he has been to them in the execution of their various duties; and their appreciation of the unfailing cordiality, courtesy, and good feeling, which have marked all his relations with them, and have contributed so much to the efficiency and popularity of the Society's work.

It is a very great satisfaction and pleasure to them to express the hope that for some time to come Mr. Newstead may, as one of themselves, be able to place his experience and knowledge at the service of the Society.

Mr. Alfred Newstead, who was for 7 years an Assistant in the Natural History Department of the Society's Museum, has been appointed Curator of the Museums and Library; and, from your Committee's knowledge of him, they feel confident he will successfully carry on the work so well begun by his brother.

The following is a summary of the Excursions and Field Meetings; and also the Lectures and Sectional Meetings during the past year:—

## EXCURSIONS AND FIELD MEETINGS.

1904.

May 18th—Evening Meeting at the Grosvenor Museum.
,, 25th—The Lache Eye and Lache Lane.
June 15th—Eaton Hall Gardens and the "Serpentine."
,, 29th—Annual Excursion to Glyn Ceiriog.
July 14th—Delamere Forest and Meres.
,, 20th—Cefn Caves and Trefnant.
,, 27th—Bache Hall Gardens and Pinetum.
Sep. 21st—Steam Mills, Boughton.

## GENERAL MEETINGS AND LECTURES.

1904.
Sep. 29th—"The King's English"—Rev. Prof. Skeat, Litt. D., F.B.A.
Oct. 27th—Annual Conversazione in the Town Hall.
Nov. 3rd—"Splashes," or Impact with Liquid Surfaces—
Mr. R. S. Cole, M A., A.M.I.C.E.
,, 17th—"Marine Life-Saving Appliances"—Mr. J. B. Kennedy.
Dec. 1st—"Cwm Bychan, its Lakes and Romantic Surroundings; and Pwllheli and District"—Mr. J. D Siddall.
,, 15th—"The Milk of the Future"—Mr. F. Litchfield.
1905.
Jan. 12th—"Fabulous Monsters"—Dr. P. H. Mules.
Feb. 2nd—"British Caves"—Mr. Harold Brodrick, M.A., of Birkdale.
Mar. 2nd—"Old Sol and his Family; or the Solar System"—
Rev. R. Killip, F.R A.S., of Southport.

*** The above Lectures were fully illustrated by Lantern Slides, &c.

## SECTIONAL MEETINGS.

### BOTANICAL.

1904.
Oct. 6th—"The Medical use of Plants," by Dr. J. T. Roberts.
1905.
Mar. 16th—"Delamere Forest," from its Historical, Natural, and Picturesque points of view, by Miss E. M. Wood (Liverpool Naturalists' Field Club).

### ZOOLOGICAL.

1904.
Nov. 10th—"Colours of Animals," by Mr. Charles Oldham.
1905.
Feb. 23rd—"Zoological Notes and Observations on the Past Year," by Mr. Charles Oldham, Mr. J Thompson, Mr. J. Arkle, The Curator (Mr. R. Newstead), and others.

### GEOLOGICAL.

1905.
Jan. 19th—"Volcanoes and Earthquakes," by
Mr. Herbert A. Hatch, B.Sc.
Mar. 23rd—"Mountain Climbing in Switzerland, and Snowdon, N. Wales," Rev. A. H. Fish, B.A., B Sc.
Apr. 14th—"Jurassic Shore-Lines; or a Fragment of World History," by Miss E. G. Skeat, D.Sc (Assoc. Newnham Coll., Mem. Geol. Association).

### NATURAL PHILOSOPHY.

1904.
Oct. 20th—"Reminiscences of a Great Thinker (Alexander Bain, LL.D.), and of Life in a Northern University," by Rev. P. J. Beveridge, M.A., B.Sc.
1905.
Feb. 9th—"Hereditary Genius," by Mr. James P. Hodge, C.A., &c.

### MICROSCOPICAL.

1905.
Apr. 6th—"Metals and their Structure," by Mr. J. Kent Smith.

## PHOTOGRAPHIC.

1904.
May 11th - "Natural History Photography" (Lecture lent by Affiliation of Photographic Societies).

Oct. 13th – "Telephotography," by DR. STOLTERFOTH.
"Some Summer Snap-Shots," by MR. J. D. SIDDALL.
"Rambles round the Leet," by MR. FRANK SIMPSON.

,, 27th – Exhibition at Conversazione of Photographs, by MEMBERS.

Nov. 11th – Exhibition of the Prize and Selected Slides in Lantern Slide Competition of the Affiliation of Photo Societies 1904.

Dec. 2nd – "Rising to the Occasion," by MR. WALTER D. WELFORD, F.R.P.S.

,, 8th – "The Kodak in Peace and War," by MR H. C. SHELLEY (War Correspondent).

1905.
Feb. 23rd to Mar. 8th } Exhibition of Prize Photos, lent by Affiliation of Photo Societies (in the Art Gallery).

,, 9th – "Character Sketches in the South of Ireland," COLONEL J. D. LYSAGHT.

Apr. 13th to 28th – Photographic Exhibition in the Art Gallery.

In addition to above 4 Special Meetings (for Beginners), and 13 Special Workers' Meetings, have been held at intervals.

## LITERATURE.

1905.
Feb. 16th – "A Study of 'In Memoriam'" (Lord Tennyson), by MRS. WHICHELLO, Tattenhall.

Mar. 30th – "The Poetry of Matthew Arnold," by REV. RICHARD JONES, B.A.

## ASTRONOMICAL.

1904.
Nov. 24th – "The Methods of Astronomers (Past, Present, and Future)," by MR. J. H. REYNOLDS, F.R.A.S., of Birmingham.

1905.
Jan 26th – "The Polarisation of Light," by DR. G. W. SIDEBOTHAM, of Newport.

NOTE - Most of the above Sectional Meetings were fully illustrated with Lantern Slides, &c.

Your Committee has met twelve times in the past year for the transaction of the Society's business; and a good average attendance at these has been well-maintained.

GEORGE P. MILN, } *Hon. Gen.*
W. F. J. SHEPHEARD, } *Secretaries.*

GROSVENOR MUSEUM,
MAY 4TH, 1905.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1905.

**Dr.**

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| By 911 Subscriptions for year 1904-5 @ 5/- | 227 | 15 | 0 | | | |
| ,, 6 Arrears ,, 1903-4 @ 5/- | 1 | 10 | 0 | | | |
| ,, 2 ,, ,, 1902-3 @ 5/- | 0 | 10 | 0 | | | |
| | | | | 229 | 15 | 0 |
| Subscriptions unpaid—20 for 1904-5 £5 \| £7 ,, ,, 4 for 1903-4 £2 \| | | | | | | |
| ,, Gross Receipts from Excursions— | | | | | | |
| To Eaton Hall Gardens .. .. | 2 | 11 | 6 | | | |
| ,, Glyn Ceiriog .. .. .. | 15 | 2 | 11 | | | |
| ,, Delamere Forest .. .. .. | 1 | 17 | 3 | | | |
| ,, Cefn Caves .. .. .. .. | 5 | 12 | 6 | | | |
| | | | | 25 | 4 | 2 |
| ,, Gross Receipts from Lectures, Evening Meetings, &c.— | | | | | | |
| Conversazione .. .. .. | | | | 16 | 13 | 10 |
| Professor Skeat .. .. .. | 2 | 5 | 0 | | | |
| Dr. J. T. Roberts .. .. .. | 0 | 2 | 0 | | | |
| Photographic Section .. .. .. | 0 | 1 | 0 | | | |
| Mr. Oldham .. .. .. .. | 0 | 1 | 0 | | | |
| Mr. Kennedy .. .. .. .. | 0 | 4 | 0 | | | |
| Mr. Reynolds .. .. .. .. | 0 | 1 | 0 | | | |
| Mr. Siddall .. .. .. .. | 0 | 8 | 0 | | | |
| Dr. Mules .. .. .. .. | 0 | 5 | 0 | | | |
| Mr. Brodrick .. .. .. .. | 0 | 2 | 0 | | | |
| Mr. Hodge .. .. .. .. | 0 | 1 | 0 | | | |
| Rev. R. Killip .. .. .. | 0 | 6 | 0 | | | |
| Lieutenant Skelton .. .. .. | 7 | 12 | 0 | | | |
| Miss Wood .. .. .. .. | 0 | 1 | 0 | | | |
| Rev. A. H. Fish .. .. .. | 0 | 1 | 0 | | | |
| Rev. Richard Jones .. .. .. | 0 | 6 | 0 | | | |
| Miss Skeat .. .. .. .. | 0 | 2 | 0 | | | |
| | | | | 11 | 18 | 0 |
| | | | | £283 | 11 | 0 |

**Cr.**

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| To Balance from last Account .. .. .. .. | | | | 8 | 15 | 5 |
| ,, Museum Management Committee .. .. .. | | | | 75 | 0 | 0 |
| ,, Natural History Museum and Library .. .. | | | | 21 | 5 | 9 |
| ,, Postages .. .. .. .. .. | | | | 31 | 12 | 0 |
| ,, Printing, Stationery, and Advertising .. .. | | | | 50 | 17 | 11 |
| ,, Expenses in connection with Excursions— | | | | | | |
| Eaton Hall Gardens .. .. .. | £2 | 2 | 6 | | | |
| Glyn Ceiriog .. .. .. .. | 14 | 8 | 0 | | | |
| Delamere Forest .. .. .. | 1 | 12 | 5 | | | |
| Cefn Caves .. .. .. .. | 5 | 5 | 8 | | | |
| | | | | 23 | 8 | 7 |
| ,, Lantern Account .. .. .. | | | | 15 | 11 | 0 |
| ,, Expenses in connection with Lectures, &c.— | | | | | | |
| Conversazione .. .. .. | 20 | 3 | 9 | | | |
| Professor Skeat .. .. .. | 2 | 10 | 0 | | | |
| Mr. J. B. Kennedy .. .. | 2 | 2 | 0 | | | |
| Dr. Sidebottom .. .. .. | 1 | 1 | 0 | | | |
| Rev. R. Killip .. .. .. | 2 | 2 | 0 | | | |
| Miss Wood .. .. .. | 1 | 11 | 6 | | | |
| Lieutenant Skelton .. .. .. | 0 | 18 | 0 | | | |
| Photographic Exhibition and Mr. Kent Smith .. .. .. | 1 | 8 | 9 | | | |
| | | | | 11 | 13 | 3 |
| ,, Salary to Assistant Secretary .. .. | | | | 15 | 0 | 0 |
| ,, Subscriptions— | | | | | | |
| Ray Society .. .. .. .. | 1 | 1 | 0 | | | |
| Palæontographical Society .. .. | 1 | 1 | 0 | | | |
| Royal Photographic ,, .. .. | 1 | 1 | 0 | | | |
| | | | | 3 | 3 | 0 |
| ,, Collecting Subscriptions .. .. | | | | 2 | 0 | 0 |
| Balance in hand on Year .. .. .. .. | | | | 5 | 0 | 4 |
| | | | | £283 | 11 | 0 |

Examined with the Accounts and Vouchers relating thereto and found to be correct, shewing a balance of £5 0s. 4d. in the hands of the Hon. Treasurer.

BERESFORD ADAMS,
E. NOEL HUMPHREYS, A.C.A. } Hon. Auditors.

Chester, 28th April, 1905.

# CURATOR AND LIBRARIAN'S REPORT.

THE additions during the past year show, unfortunately, a decided falling off in the number of species, and also in the number of contributors. But while this is so, your Curator has pleasure in stating that many of the donations are of special interest and value, or of great rarity.

Among the Birds may be mentioned the specimen of the Purple Gallinule *(Porphyrio cæruleus)*, presented by LORD KENYON. This remarkable species belongs to the brightly-coloured Rails, and is a native of the Mediterranean countries. Whether it was a migrant from its native habitat, or whether it had escaped from captivity in this country, are points which will, probably, never be settled. Your Curator saw this specimen (when living) in the aviary at Greddington, shortly after its capture on the borders of Flintshire; and he also interviewed the man who captured it. Unfortunately the MSS. notes giving full particulars of the capture of the bird, were inadvertently mislaid, and the exact locality cannot now be given. MR. CHAS. OLDHAM has also made two valuable contributions: a Honey Buzzard *(Pernis apivoris)* and a Scoter *(Œdemia nigra)*—both species being new to the collections. A specimen of the Bittern is also worthy of comment.

Among the tracheates are several insects of much interest. MR. ARKLE has again contributed many species of great interest, several of which are new, not only to the Society's Collections but also to the district.

The collections of Birds and Insects have been thoroughly overhauled and cleaned, and some slight alterations made in the classification of the two groups.

Your Curator desires also to draw attention to the fact that the Society's Collections of Books have been removed to, and classified in, the more spacious room which was set apart as a library (with the sanction of the Management Committee) for the use of the two Societies.

In the last Annual Report of this Society your Curator called attention to the course of Nature-Study Lessons, which were given (by invitation of the Museum Management) to children recruited from the higher standards of the Elementary Schools in this City. Thirty-six lessons were given last year, the total number of attendances being, approximately, 1,115. This year a fresh course of subjects was selected by the Committee of Education, and twelve lessons were given; the total number of children attending the course being 420. This makes a grand total of forty-eight lessons given; and brings the grand total of attendances to 1,535. The subjects chosen for 1905 were as follows:—

1. The Salmon
2. The Frog and its allies
3. The British Serpents
4. The edible Cockle and Mussel
5. The British Sticklebacks
6. The British Bats.

A series of specimens was selected from the Society's Collections to illustrate the various subjects taught; but your Curator wishes here to express

his thanks to Mr. J. B. Feilding for living ova of the salmon; and to Master Frank Simpson for the loan of embryo specimens of the common frog. The children took a keen interest in the development of the embryo salmon, the latter being successfully reared to the stage a little beyond the period when the yolk sac became absorbed. The microscope was used to show the circulation of the blood in the young salmon; and the oxyhydrogen lantern was used to illustrate certain phases in the habits of our British Bats, by photographs taken from life.

Your Curator has (jointly with Mr. W. Shone) made three short expeditions to various parts of the Society's district, to make a series of photographs illustrative of some phases in land-sinkage, &c.; the cost of these expeditions being defrayed by Mr. Shone.

## LIST OF ADDITIONS.

Mr. J. Arkle—28 species of *Lepidoptera.*

Mr. Hugh Brocklebank (9th Lancers) and Mr. Edmund Brocklebank—14 specimens of Exotic Corals (for Teaching Collections).

Mr. A. D. Pitcairn Campbell—6 species of *Lepidoptera.*

Mr. Sidney Cummings—2 species of *Lepidoptera;* 2 abnormal Nests.

Colonel B. G. Davies-Cooke—36 specimens of various Fossils and Minerals (collected by the Curator); 10 species of Wild Plants (collected by the Curator); Nest, &c., of Dipper *(Cinclus aquaticus)*, completing the life-cycle (collected by the Curator); clutch of 7 Eggs of Land Rail; 1 Water Rail.

The Curator—Various specimens of the Geological formation at Llanefydd, in which a Skull of *Bos primigenius* was recently found; 36 larvæ of *Euchelia Jacobææ;* 50 larvæ of *Arctia lubricipeda;* 3 larvæ of *Odontoptera bidentata;* 4 specimens of a species of *Crabro*, together with a series of the brood-cells, stored with food for the larvæ.

Mr. George Davison—1 Sparrow Hawk.

Mr. J. F. Dutton (Warrington)—10 species of *Coleoptera.*

Mr. F. W. Hutton—Black variety of House Mouse.

Mr. R. Gresley Jones—Larvæ of *Orgyia fascelina.*

Lord Kenyon—Specimen of Purple Gallinule *(Porphyrio cæruleus).*

Mr. Alfred Newstead—1 Kingfisher; 1 Bittern (Cheshire example); 1 Immature Cuckoo.

Mr. C. Oldham—5 species of *Mollusca;* 1 specimen of the rare *Prionus coriarius*; 1 Common Scoter *(Œdemia nigra)*; 1 Honey Buzzard *(Pernis apivoris).*

Mr. R. O. Orton—1 Kingfisher (male).

Mr. Oxenbould—Variety of the Egg of the Blackbird.

Mr. W. Shone—MSS. Notes on the Wynne and Cambrian Slate Quarries.

Mr. J. D. Siddall—12 specimens of Red Plant Bug *(Therapha hyoscyami)*, together with notes on its distribution in the Pwllheli district.

Miss L. E. Tomlin—1 specimen of the Scaly Galathea *(Galathea squamosa).*

Purchased—1 male Pochard.

## ADDITIONS TO THE SOCIETY'S LIBRARY 1904-1905.

An unusual number of additions have been made to the Library; and the Society's best thanks are due to the President (the Rev. A. H. Fish, B.Sc.), Dr. W. M. Dobie, Mr. F. W. Longbottom, Mr. Chas Oldham, and Mr. Maddocks, for many valuable additions.

Abney, Captain W. de. "Instruction in Photography," 1892. *Donor*, Mr. F. W. Longbottom.

Adams, Lionel E, B.A. "The Census of British Land and Freshwater Mollusca," 1902. *Donor*, Mr. Chas. Oldham.

Barrow. Report and Proceedings of the Naturalists' Field Club, 1899.

Beale, Lionel S., F.R.S. "How to work the Microscope," 1880. *Donor*, Mr. F. W. Longbottom.

Booth, E. T. Catalogue of the Cases in the Dyke Road Museum, Brighton. *Donor*, Mr. Chas. Oldham.

Botanical Exchange Club Report, 1895.

Bristol. Proceedings of the Naturalists' Society, 1904.

Cardiff. Transactions of the Naturalists' Society, Vol. XXXVI., 1903.

Carpenter, Dr "Principles of Comparative Physiology," 1854. *Donor*, Dr. W. M. Dobie.

—— "Principles of Human Physiology," 1855. *Donor*, Dr. W. M. Dobie.

Ceylon. "Report of the Government on the Pearl Oyster," 1904. *Donor*, Dr W. M. Dobie.

Claus, Dr. Carl. "Grundzüge der Zoologie," Vols. I and II., 1880. *Donor*, The President (Rev. A. H. Fish).

Cockerell, T. D. A. "The Making of Biologists." *Donor*, Mr. Robt. Newstead.

Coward, T. A. "Some Habits of Natterer's Bat," 1905.

"Cruise of H.M.S. 'Bacchante,'" 1879-1882; compiled from Journals, Letters, and Note-books of Prince Albert Victor and Prince George of Wales; 2 Vols., I.-II., 1886. *Donor*, Mr. F. W. Longbottom.

"D'Astronomie populaire," Paris, 1890. *Donor*, Mr. Robt. Newstead.

Darwin, Charles. "Vegetable Mould and Earthworms," 1881. *Donor*, The President (Rev. A. H. Fish).

Darwin, Francis. "Life and Letters of Charles Darwin," Vols. I., II., III., 1887. *Donor*, The President (Rev. A. H. Fish).

Davies, George E. "Practical Microscopy," 1882. *Donor*, Mr. F. W. Longbottom.

Dixon. "Stray Feathers from many Birds," 1890. *Donor*, Mr. Chas. Oldham.

Dorset. Proceedings of Natural History and Antiquarian Field Club, Vol. XXIV., 1903.

Ealing. Report and Transactions of the Natural Science and Microscopic Society, 1903-1904.

"Entomologist," 1904.

"Entomologists' Monthly Magazine," 1904.

Entomological Society, Transactions of, Part III., 1904.

"First Report upon the *Fauna* of Liverpool Bay and the Neighbouring Seas," 1886. *Donor*, Mr. F. W. Longbottom.

Foster and Balfour. "Elements of Embryology," 1883. *Donor*, The President (Rev. A. H. Fish).

Fowler. "Osteology of Mammalia," 1876. *Donor*, The President (Rev. A. H. Fish).

Frankland, Percy and C. G. "Micro-Organisms in Water," 1894. *Donor*, The President (Rev. A. H. Fish).

Gardner, Willoughby, F.L.S. List of Hymenoptera aculeata of Lancashire and Cheshire, 1901.

Geological Society of London, List of the, 1904.

Geological Society, Quarterly Journal of the, Nos. 218—240. *Donor*, Mr. A. W. Lucas.

Geological Society, Quarterly Journal of the, Nos. 195—258. *Donor*, Mr. A. W. Lucas.

Geological Survey, U.S.A., 24th Annual Report, 1902-3.

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## NOTES ON WYNNE AND CAMBRIAN SLATE-QUARRIES, GLYN CEIRIOG,

By Mr. Wm. Shone, F.G.S.

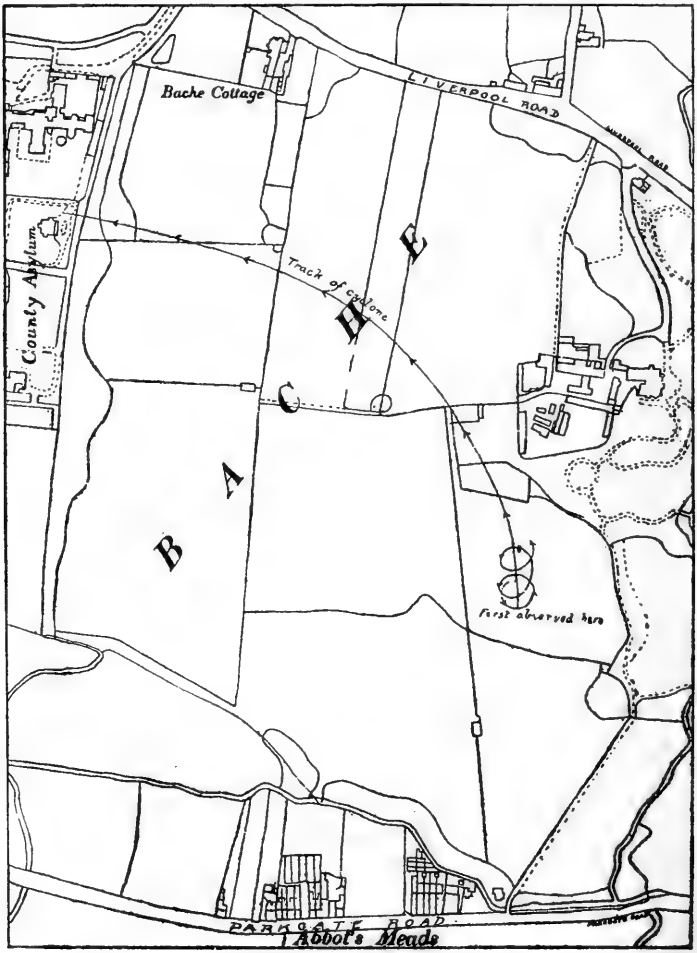
The following particulars were given to me on 29th June, 1904, by F. E. Rooper, Esq., F.G.S., and they are of great interest with regard to the Orientation of the Mountain Systems of Wales. The system of the Longmynd is N. 25° E. (see "Prestwich's Geology," Vol. I., p. 292):—

| | |
|---|---|
| Top of Rock—"Dirty Bed"—useless .. | .. 53 feet |
| Beneath the above the Slate Vein .. | .. 70 ,, |
| Run of Slate Vein .. .. .. | .. 71° W. of N. |
| Pillaring .. .. .. .. .. | .. 1° E. of N. |
| Dip of Vein .. .. .. .. | .. 42° E. of N. |
| Dipping .. .. .. .. .. | .. 15° |
| Cleavage .. .. .. .. .. | .. 42° E. of N. |
| Dipping .. .. .. .. .. | .. 25° |

# PARTICULARS OF A CYCLONE IN THE NEIGHBOURHOOD OF CHESTER, July 21st, 1904,

By Mr. J. A. McMichael, B.A., B.Sc.

I observed a whirlwind of extraordinary violence pass over the fields of the Bache Hall Estate, at 10-30 a.m. on the above date. The vortex at the base was about ten yards across; and the hay, which was lying in heaps, was caught up and raised in masses to a great height – probably 500 feet. As shown in the map, the whirling was "contra clockwise," and the whole disturbance passed across the fields in a similar circular direction. There was a dead calm over the rest of the estate, and the path could be easily traced by noticing how some of the trees were in violent motion, while others quite close to them were perfectly motionless. The morning was very hot, but in the track of the cyclone (which I purposely entered) the wind was icy cold. About six heaps of hay were bodily removed, and some of it was deposited in the Asylum grounds—nearly half-a-mile away.



# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1904,

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

The results here given are deduced from observations of the standard instruments, taken twice daily, at 9·0 a.m. and 9·0 p m. local mean time. Returns are sent to the Royal Meteorological Society, the Meteorological Council, the Scottish Meteorological Society, and many private observers in different parts of the Empire.

January.—A rather warm dripping month, 1·6° above the average. This adds another year to that remarkable series of warm Januaries experienced of late, viz.: 1898, 7·0°; 1899 2½°; 1900, 2½°; 1901, ¾°; 1902, 3·0°; 1903, 1¾°; and 1904, fully 1½°; in all, seven consecutive Januaries with a mean of 2¾° above the average temperature of the 25 years 1878-1902. The day temperature exceeded 50·0° on four days; and the night temperature exceeded 40 0° on five nights. The mean temperature of the 27th January was nearly equal to that of 9th June; the night temperature of the former being 2·3° higher than the latter. Only six frosts in Stevenson's screen; on grass 23; the minimum temperature being 25·5°. The amount of rainfall normal, but the number of rainy days excessive—23 days. It rained daily from the 1st until the 20th, excepting the 5th. Bright sunshine normal. Winds almost equally distributed between easterly and westerly; one gale from the W N W. on 14th.

February.—Temperature 1·2° below the normal, being just equal to an average January There were nine frosts in Stevenson's screen; 18 on grass; the minimum temperature being 23·7° on the 29th; and exceeded 40·0° only four times. The maximum shade temperature exceeded 50·0° only twice. Snow fell on two days—the 25th and 26th—but did not lie. Rainfall and number of rainy days both excessive, the amount being 1·5 inches in excess. Westerly winds only slightly preponderating. There were three westerly gales. A thunderstorm passed to the S.W. about 11-30 p.m. on the 12th. The sun temperature (black bulb in vacuo) was above 80·0° on two days. Bright sunshine deficient; 6·91 hours on the 18th was registered out of a possible 9¾ hours A very dull, wet, cold, cheerless month.

March.—A cold month, the temperature being 1·4° below the average, due to the low day temperatures. 50·0° was exceeded on only 12 days; the maximum, 57·6° on the 20th; the night temperatures were normal. Nine frosts in Stevenson's screen; on grass 23; lowest temperature 24·0° on the 12th. Rainfall normal, on fewer than the average number of rainy days. Sun temperature exceeded 90·0° on one day only, the 29th. Winds light, but principally from N.E. Bright sunshine very deficient, and a large number of sunless days; about 10 hours registered on 27th out of a possible 12 hours. A very dull, cold, backward month.

April.—A rather warm dry month, 1·8° above the average temperature; with two-thirds of an inch short of the normal amount of rain. High night temperature, 2·7° above average; lowest, 36·7° on 26th. Maximum temperature above 60·0° on nine days; highest, 65·6° on 19th. Temperature in sun, 121·2° on 30th Prevailing winds westerly, rising to the force of a gale on 5th, 6th, 10th, and 24th. Fourteen hours more than the average of bright sunshine; 11½ hours on the 18th out of a possible amount of 14. No frosts in Stevenson's screen; 10 on ground. Solar halo on 25th. An exceptionally windy month, especially the first half of it.

May.—Almost normal in temperature, but with a slightly greater mean range than usual. Lowest shade temperature 34·9°; highest shade tempera-

ture 72·8°. Maximum temperature exceeded 65·0° only five times. Minimum temperature only five times exceeded 50·0°. Highest temperature in sun 114·0° on 14th. Rain (over the whole month), both as to amount and number of days, normal; but very dry the first half, and very wet the second half of month. Bright sunshine deficient by 66 hours, and double the average number of sunless days. Three thunderstorms took place: two on the night of the 16th-17th, and the other on the 31st. Prevailing winds from the S.W.—rather light. No frost in Stevenson's screen; six on grass. A dull sunless month, with a flurry of snow at an early hour on the 8th.

JUNE.—A very sunny but decidedly cool month, the temperature being 1·7° below the average. Amount of rain, three-quarters-of-an-inch short, fell on fully three days less than the usual number. Temperatures in sun and on ground very considerably below the average Highest temperature in shade 76·5°; lowest, 42·0°. Shade temperature exceeded 72·0° five times; and fell below 45·0° five times. Temperature in sun above 110·0° on ten days; and on ground below 40·0° on five nights. Thunderstorm on the afternoon of the 24th. Severe gale from the N.W. on the 25th; moderate gales from the S.W. on the 16th and 21st.

JULY.—A warm month, 2·0° above the average temperature, and very dry; but quite half of the average amount of rainfall in light showers, on three-and-a-half days less than the average number of rainy days. No day without bright sunshine; total amount 6% above the average Thunderstorm on the 12th. Temperature in sun 126·0° on the 6th; on ground, five times 45·2° or under. Wind south-westerly, only once rising to 5 from S.W. on the 1st; quiet evenings.

AUGUST.—A rather cool and wet but sunny month Temperature in shade 2·1° below the average. Fully one-third-of an-inch more than the average rainfall; considerably more than an inch fell on Sunday the 21st. There were 16 rainy days. The highest shade temperature was 82·2°, and the lowest 43·1°. In the sun the highest was 118·4° on the 28th; and the lowest on the ground 36·0° on the 25th The first 12 days were warm, dry, and calm; the remaining part of the month cool, wet, and windy.

SEPTEMBER.—A very dry, sunny, rather mild, and decidedly windy month, the wind being almost equally from the S.E. and S.W. Bright sunshine 8% above the average; and rainfall deficient by about three-quarters-of-an-inch. Two-thirds of the rainfall took place on two days the 2nd and last of the month. With the exception of a slight shower on the 12th, no rain fell from the 6th to the 30th—a period of 22 rainless days. The shade temperature was above 67·0° on nine days, and under 47·0° on 15; the highest 71 6°, and lowest 37·9°. In the sun the temperature was 100·0° on 11 days; and on the ground frost on three nights. The mean daily range of temperature was 3·5° above the average.

OCTOBER.—An extremely dry and rather quiet and dull month, with an unusually high mean atmospheric pressure. Mean temperature in shade 2·2° above the average. Frost on ground on eight nights, and twice in shade—31·3° on 3rd and 31·5 on 14th. In sun at or above 90 0° on five days. Five days without any bright sunshine. Two inches short of the average rainfall, and only half the average number of rainy days. The deficiency of rain and rainy days is most remarkable, especially when it is taken into account that October is usually the wettest month of the whole year. Fog on four days. Prevailing winds S.W. Gale on the 6th from the W.N.W.

NOVEMBER.—Up to the 20th a dull, dry, but rather mild month; from the 21st nearly sunless, very wet, and almost arctic in temperature, the mean average in the shade for the 10 days being 34·5°, which is almost 4·0° below the average of the month of January (the coldest in the year)—a change equal to passing at once from the middle of an average September to the

beginning of an average December. Shade temperature above 55·0° four times; below 35·0° nine times; highest 60·5°; lowest 19·0°. Severe gale from W. on 9th; moderate gale from N.W. on 8th. Rainfall deficient by three-quarters-of-an-inch. Fog on four days. Prevailing winds north-westerly. Snow fell on two days. Hoar frost on three days.

DECEMBER.—A very cold, calm, dull, dry, foggy month. Snow fell on the 9th, but was gone on the morning of the 10th, when it rained. Severe fog on three days, especially on the 22nd and 23rd. Frost on the ground on 24 nights. Maximum shade temperature only exceeded 50·0° on nine days, and minimum fell to 30·0° on nine days. Wind rose to the force of a gale on the 30th, from the N.W.; strong W.S.W. wind on the 17th. Rainfall deficient, both in amount and number of days on which it fell. Bright sunshine slightly below the average; 16 days without any.

As the tables give the meteorological elements for the year 1904 only, it is desirable to add a comparison of the winter and spring months of the present year in brief.

## SHADE TEMPERATURE, AND DIFFERENCE FROM AVERAGE.

| **Winter of 1904-5.** | | **Spring of 1905.** | |
|---|---|---|---|
| December .. .. | 39·5°—0·1° | March .. .. | 45·1°+2·7° |
| January .. .. | 39·8°+1·2° | April .. .. | 45·4°—1·7° |
| February .. .. | 42·5°+2·6° | May .. .. | 52·5°+0·1° |
| Mean .. .. | 40·6°+1·2° | Mean .. .. | 47·7°+0·4° |

THE WINTER MONTHS.—*December*—almost normal in temperature, but deficient in rainfall. *January*—dry and windy, mild and sunny; first two weeks very fine; last two cold, with excessively keen winds. *February*—very mild, 2·6° above the average. This is the sixth *consecutive* month with a shortage of rain, the deficiency amounting in all to five inches for the six months. An "open" winter; mild, dry, and dull.

THE SPRING MONTHS—*March*—unpleasantly wet, breaking in upon the long series of dry months, but only reducing the deficiency by about three-quarters-of-an-inch. *April*—a very cold and comparatively dry month in the amount of the rainfall, with a prevalence of bitterly cold easterly winds. *May*—another dry month, but normal in temperature; very high pressure, and prevalence of easterly winds. A cold, dry, backward spring for the last two months, in contrast to the wet, mild March.

## NOTEWORTHY PHENOMENA OF 1904.

| | |
|---|---|
| Greatest atmospheric pressure ..... | 30·777 in., 22nd January |
| Least ,, ,, ..... | 28·775 in., 9th February |
| Hottest day in shade ..... ..... ..... .... | 82·6 degrs., 11th July |
| Coldest night in shade ..... ..... ..... | 19·0 degrs., 27th December |
| Greatest range of temperature in 24 hours .... | 33·7 degrs., 27th September |
| Least ,, ,, ,, .... | 2·2 degrs., 26th February |
| Hottest day in sun ..... ..... ..... ..... .... | 126·0 degrs., 6th August |
| Coldest night on ground ..... ..... | 12·5 degrs., 26th February |
| Greatest excess of open air temperature over shade temperature, 30th April | 57·6 degrs., |

Greatest difference between lowest temperature in shade and on ground, 13·8 degrs., 25th September

Greatest Rainfall on any one day, 1·090 inches, 21st August

Latest early Summer frost in shade, 4ft. above ground, 4·0 degrs , 27th March

Earliest Autumn frost ,, ,, ,, 0·7 degrs , 3rd Oct.

Severe gales, 25th June and 9th November

Snow fell on 7 days (a flurry at 7.30 a.m., 7th May)

Thunderstorms in February, May, June, and July

Greatest nnmber of consecutive days on which rain fell : 6th to 20th January, 15 days

Greatest number of consecutive days on which no rain fell : 13th to 29th September, 17 days

Sunniest day of the year, 15 hours on 10th July, being 90 per cent. fully of the greatest possible amount

More bright sunshine in the afternoons, averaging half-an-hour on each day of bright sunshine.

Welsh hills at 9·0 a.m. —These were only visible on one-third of the days of the year : 55 days clearly, and 23 very clearly seen

## EXPLANATIONS.

*Local Mean Time* is used for the regular observations.

*The Barometer* readings, taken at 9 a m and 9 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9·0 a.m., and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9 a.m., and placed to previous day.

*Ground Temperatures* read twice daily at 9 0 a.m. and 9·0 p.m. The lowest reading for the 24 hours, ending at 9·0 a m., is entered to the previous day.

*Underground Temperatures* taken daily at 9·0 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew Point (as determined by Glaisher's Factors), by that corresponding to the temperature of the air (*i.e.*, the Dry-bulb reading).

*The Rain* is measured at 9·0 a.m., and the amount entered to the previous day. A fall of 0·006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9·0 a.m. and 9·0 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8·0 an overcast day.

The *Wind* direction is taken by means of a Compass Nephoscope, from the drift of the lower clouds

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Sunshine Record.*—The photographic traces are fixed *before* being measured,

*Fog, &c.*—The fog, haze, &c., are made from the visibility of objects and lights at definite distances from Rutland Cottage.

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | Bright Sunshine. Hours ending Local Apparent Time of each Day of the Month. Forenoon. 6 | 7 | 8 | 9 | 10 | 11 | Noon | Afternoon. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Monthly. Total Hours. | Greatest Possible. | Percentage. | No. of days without. | Seasons. Hours and Percentage. | Cloud (1—10). Daily Average. 9 a.m. | 9 p.m. | Mean. | No. of Days. Overcast. | Clear. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. ... | | | | | 2·57 | 6·74 | 9·18 | 9·42 | 11·82 | 4·24 | | | | | | 43·97 | 17·9 | 14 | | Winter 131·67 17·7% | 8·6 | 7·2 | 7·9 | 17 | 1 |
| Feb. ... | | | | 2·58 | 9·66 | 10·58 | 9·41 | 7·00 | 6·14 | 6·08 | 5·26 | 1·50 | | | | 58·21 | 20·8 | 11 | | | 8·3 | 6·9 | 7·6 | 14 | 1 |
| March | | | 0·50 | 4·02 | 8·58 | 11·09 | 12·91 | 10·74 | 11·77 | 11·15 | 9·16 | 7·38 | 4·66 | 1·08 | | 93·04 | 25·6 | 10 | | | 8·1 | 6·6 | 7·4 | 17 | 3 |
| April ... | | | 0·24 | 12·74 | 14·08 | 15·25 | 18·00 | 17·48 | 17·81 | 16·91 | 17·93 | 20·44 | 17·25 | 16·00 | 4·33 | 188·46 | 45·4 | 2 | | Spring 428·28 33·6% | 8·3 | 6·8 | 7·5 | 16 | — |
| May ... | | | 1·91 | 11·26 | 13·09 | 10·83 | 10·74 | 12·08 | 14·24 | 14·99 | 12·83 | 12·01 | 13·41 | 12·41 | 6·74 | 0·24 | 146·78 | 30·2 | 7 | | | 8·5 | 6·9 | 7·7 | 17 | 1 |
| June ... | 9·57 | 13·65 | 17·34 | 16·33 | 18·18 | 18·92 | 17·49 | 16·00 | 17·41 | 17·50 | 17·00 | 17·08 | 18·75 | 14·67 | 5·58 | | 235·47 | 47·2 | 2 | | | 7·3 | 6·9 | 7·1 | 13 | 2 |
| July ... | 10·82 | 15·01 | 17·10 | 19·58 | 20·07 | 22·40 | 20·34 | 20·33 | 19·57 | 17·09 | 17·89 | 15·09 | 13·16 | 11·16 | 4·83 | | 244·44 | 48·0 | — | Summer 672·74 46·5% | 5·5 | 5·7 | 5·6 | 11 | 4 |
| Aug. ... | | 1·49 | 16·09 | 16·15 | 16·69 | 15·74 | 20·25 | 17·53 | 18·34 | 17·41 | 16·66 | 16·01 | 12·74 | 7·73 | | | 192·83 | 42·9 | 1 | | | 7·6 | 6·0 | 6·8 | 12 | — |
| Sept. ... | | | 9·83 | 15·75 | 25·00 | 16·50 | 17·47 | 18·75 | 17·50 | 16·97 | 17·59 | 14·99 | 6·16 | 0·42 | | | 166·93 | 44·6 | 3 | | | 5·9 | 3·8 | 4·8 | 6 | 4 |
| Oct. .. | | | | 1·83 | 5·99 | 12·91 | 13·65 | 13·94 | 14·56 | 14·24 | 10·57 | 3·67 | 0·33 | | | | 91·69 | 28·5 | 5 | | Autumn 292·59 39·0% | 8·1 | 6·3 | 7·2 | 15 | 1 |
| Nov. ... | | | | 0·08 | 3·66 | 5·74 | 6·83 | 7·42 | 5·75 | 3·83 | 0·66 | | | | | | 33·97 | 13·4 | 16 | | | 8·3 | 7·4 | 7·8 | 16 | 1 |
| Dec. .. | | | | | 0·25 | 2·33 | 6·84 | 8·42 | 9·74 | 1·83 | 0·08 | | | | | | 29·49 | 13·0 | 16 | | | 7·1 | 7·1 | 7·1 | 14 | 3 |
| | 20·39 | 32·80 | 88·38 | 108·05 | 129·24 | 153·51 | 161·76 | 162·63 | 163·88 | 139·11 | 125·54 | 103·66 | 80·63 | 45·05 | 10·65 | | 1525·28 | 34·5 | 87 | | | 7·6 | 6·5 | 7·0 | 168 | 21 |

During Forenoon 694·13. During Afternoon 831·15.

# METEOROLOGICAL OBSERVATIONS

## RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N.; Long. 11m. 36s. W.

| | MONTHLY SUMMARY OF | | | |
|---|---|---|---|---|
| | JAN. | FEB. | MARCH. | APRIL |
| PRESSURE (reduced to 32° F., and mean sea leve`)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 29·880in. | 29·545in. | 30·000in. | 29·906 |
| Highest reading | 30·777in. | 30·348in. | 30·480in. | 30·310 |
| ,, ,, Date of | 22 | 28 | 23 | 18 |
| Lowest ,, | 28·883in. | 28·775in. | 29·244in. | 29·234 |
| ,, ,, Date of | 14 | 9 | 29 | 13 |
| Range | 1·894in. | 1·573in. | 1·236in. | 1·076 |
| TEMPERATURE in shade (Stephenson's screen)— | | | | |
| Approximate mean | 40·4° | 38·8° | 40·6° | 48·6° |
| Arithmetical ,, | 40·3° | 38·8° | 40·7° | 49·0° |
| Dry bulb (9 a.m. and 9 p.m.) mean | 40·0° | 38·1° | 39·9° | 48·2° |
| Climatological mean | 40·2° | 38·7° | 41·0° | 48·9° |
| Mean maximum | 44·8° | 43·3° | 47·4° | 56·6° |
| ,, minimum | 35·7° | 34·4° | 34·1° | 41·4° |
| Extreme maximum | 54·6° | 56·0° | 57·6° | 65·6° |
| ,, ,, Date of | 18 | 21 | 20 | 19 |
| ,, minimum | 25·5° | 23·7° | 24·0° | 36·7° |
| ,, ,, Date of | 22 | 29 | 12 | 26 |
| ,, range | 29·1° | 32·3° | 33·6° | 28·9° |
| Mean daily range | 9·1° | 8·9° | 13·3° | 15·2° |
| Maximum daily range | 14·6° | 18·4° | 23·4° | 27·1° |
| ,, ,, Date of | 26 | 19 | 11 | 19 |
| Minimum ,, | 2·8° | 2·2° | 5·9° | 10·1° |
| ,, ,, Date of | 20 | 26 | 6 | 15 |
| Number of nights at or below 32° | 6 | 9 | 9 | — |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 54·0° | 61·7° | 74·0° | 95·3° |
| Extreme maximum | 71·0° | 88·0° | 88·0° | 121·2° |
| ,, ,, Date of | 28 | 21 | 21 | 30 |
| Greatest excess over shade maximum | 25·5° | 36·6° | 42·4° | 67·6° |
| ,, ,, ,, ,, Date of | 29 | 28 | 29 | 30 |
| Average ,, ,, ,, | 9·2° | 18·4° | 26·6° | 38·7° |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 31·7° | 30·8° | 29·8° | 35·0° |
| Extreme minimum | 21·6° | 19·6° | 21·0° | 28·0° |
| ,, ,, Date of | 22 | 29 | 11 | 26 |
| Greatest difference from shade minimum | 9·8° | 7·9° | 8·8° | 11·4° |
| ,, ,, ,, ,, Date of | 21 | 7 | 21 | 21 |
| Mean ,, ,, ,, | 4·0° | 3·6° | 4·3° | 6·4° |
| Number of nights at or below 32° | 23 | 18 | 23 | 10 |
| TEMPERATURE underground— | | | | |
| Mean at 1 foot | 40·1° | 39·7° | 40·2° | 47·0° |
| Range ,, | 5·8° | 12·4° | 9·3° | 9·1° |
| Mean at 2 feet | 40·9° | 40·3° | 40·6° | 46·1° |
| Range ,, | 2·8° | 1·8° | 7·2° | 6·9° |
| Mean at 3 feet | 42·0° | 41·4° | 41·2° | 45·6° |
| Range ,, | 1·0° | 1·8° | 3·9° | 5·0° |
| Mean at 4 feet | 43·0° | 40·3° | 41·9° | 45·0° |
| Range ,, | 1·1° | 1·2° | 2·3° | 4·0° |
| Air temperature, 9 a.m. | 39·4° | 37·8° | 40·2° | 49·5° |
| Range of ,, ,, | 21·5° | 21·2° | 20·8° | 12·3° |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 2·040 | 3·240 | 1·675 | 0·93 |
| ,, ,, since 1st January | — | 5·280 | 6·955 | 7·90 |
| Maximum fall in 24 hours | ·240 | ·690 | ·410 | ·2 |
| ,, ,, Date of | 30 | 3 | 13 | 24 |
| Number of days 0·01 fell | 23 | 20 | 11 | 17 |
| ,, ,, since 1st January | — | 43 | 54 | 71 |
| Mean relative humidity, 9 a.m. | 94 | 91 | 89 | 77 |
| ,, ,, 9 p.m. | 94 | 89 | 92 | 88 |
| ,, ,, of both | 94 | 90 | 90 | 82 |
| Mean vapour pressure, 9 a.m. | ·226 | ·206 | ·218 | ·2 |
| ,, ,, 9 p.m. | ·235 | ·205 | ·223 | ·2 |
| ,, ,, of both | ·230 | ·206 | ·220 | ·2 |
| Mean dew point, 9 a.m. | 37·6° | 35·3° | 36·8° | 42·7 |
| ,, ,, 9 p.m. | 38·5° | 35·2° | 37·3° | 43·1 |
| ,, ,, of both | 38·0° | 35·3° | 37·0° | 42·9 |

# 'OR THE YEAR 1904.

OAD, CHESTER.

MOSPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| AY. | JUNE. | JULY. | AUGUST. | SEPT. | OCTOBER. | NOV. | DEC. | YEARLY SUMMARY. |
|---|---|---|---|---|---|---|---|---|
| ·942in. | 30·061in. | 29·995in. | 39·990in. | 30·043in. | 30·104in. | 30·055in. | 29·903in. | 29·952in. |
| ·268in. | 30·394in. | 30·283in. | 30·223in. | 30·315in. | 30·521in. | 30·547in. | 30·622in. | 30·777in. |
| 19 | 22 | 9 | 8 | 18 | 13 | 14 | 19 | 22 Jan. |
| ·529in. | 29·529in. | 29·706in. | 29·595in. | 29·715in. | 29·362in. | 29·435in. | 28·890in. | 28·775in. |
| 6 | 25 | 26 | 14 & 18 | 14 | 5 | 9 | 12 | 9 Feb. |
| ·739in. | 0 865in. | 0·577in. | 0·628in. | 0·600in. | 1·159in. | 1·112in. | 1·732in. | 2·002in. |
| 1·7° | 56·6° | 62·7° | 58·2° | 55·7° | 50·6° | 43·4° | 40·0° | 49·8° |
| 2·1° | 57·3° | 62·7° | 58 7° | 56·1° | 50·8° | 43·1° | 39·8° | 49·1° |
| 1·5° | 56·1° | 62 5° | 57·0° | 56·0° | 48·8° | 42·5° | 39·4° | 48·3° |
| 2·1° | 57·3° | 63·4° | 58·4° | 56·5° | 50·8° | 42 8° | 39·5° | 49 1° |
| 0·3° | 66·0° | 73·1° | 67·2° | 65·4° | 58·3° | 48·5° | 44·5° | 56·3° |
| 4·0° | 48·5° | 53·7° | 50·2° | 46·8° | 43·4° | 37·8° | 35·2° | 42·1° |
| 2·8° | 76 5° | 82 6° | 82·2° | 71·6° | 67·8° | 60 5° | 57·6° | 82·6° |
| 26 | 29 | 11 | 10 | 2 | 5 | 9 | 16 | 10 July |
| 4·9° | 42·0° | 45·0° | 43·1° | 33·0° | 31·3° | 19·0° | 24·0° | 19·0° |
| 8 | 28 | 8 | 30 | 27 | 3 | 27 | 22 & 23 | 27 Nov. |
| 7·9° | 34·5° | 37·6° | 39·1° | 38·6° | 36·5° | 41·5° | 33·6° | 41·5° |
| 6·3° | 17·5° | 19·4° | 17·0° | 18·6° | 14·9° | 10·7° | 9·3° | 14·2° |
| 0·3° | 32·8° | — | — | 33·7° | 28·4° | 21·2° | 18·9° | 33·7° |
| 16 | 28 | — | — | 27 | 3 | 24 | 18 | 27 Sept. |
| 6·5° | 7·3° | — | — | 9·1° | 3·0° | 4·0° | 3·1° | 2·2° |
| 7 | 15 | — | — | 3 | 31 | 1 | 24 | 26 Feb. |
| — | — | — | — | — | 2 | 7 | 12 | 45 |
| 5 7° | 105·0° | 112·7° | 99·8° | 98·0° | 79·0° | 61·5° | 50·8° | 82·3° |
| 4·0° | 119·0° | 126 0° | 118·4° | 111·6° | 97·0° | 81·3° | 71·3° | 126·0° |
| 14 | 17 | 6 | 28 | 2 | 1 | 5 & 6 | 1 | 6 Aug. |
| 1 0° | 50·9° | — | — | 44·4° | 36·5° | 28·7° | 17·6° | 57·6° |
| 14 | 21 | — | — | 3 | 1 | 6 | 7 | 30 April |
| 5·4° | 39·0° | 39·6° | 32·6° | 32·6° | 20·7° | 13·0° | 6·3° | 26·0° |
| 0·2° | 44·8° | 50·6° | 44·9° | 40·2° | 39 1° | 32·6° | 30·0° | 37·6° |
| 8·3° | 35·0° | 43·2° | 36·0° | 29·2° | 29·3° | 12·5° | 20·3° | 12·5° |
| 8 | 4 | 9 | 25 | 25 | 14 | 26 | 11 | 26 Nov. |
| 1 8° | 10·4° | — | — | 13·8° | 10·2° | 12·2° | 11·8° | 13·8° |
| 14 | 29 | — | — | 25 | 5 | 12 | 5 | 25 Sept. |
| 4·0° | 3·7° | 3·1° | 5·3° | 6·6° | 4·3° | 5·2° | 5·2° | 4·6° |
| 6 | — | — | — | 3 | 8 | 16 | 24 | 131 |
| 1·9° | 56·9° | 61 8° | 58·6° | 56·2° | 51·2° | 44·9° | 40·3° | 49·1° |
| 8·8° | 16·4° | 5·2° | 4·1° | 5·2° | 6·7° | 13·0° | 7·8° | 8·2° |
| 0·7° | 55·5° | 59·8° | 58·3° | 56·8° | 52·4° | 47·2° | 42·1° | 49·2° |
| 5.3° | 4·9° | 3·6° | 3·1° | 4·6° | 4·3° | 8·6° | 4·4° | 4·8° |
| 9·5° | 53·8° | 57·3° | 57·9° | 56·5° | 52·9° | 48·8° | 43·7° | 49·2° |
| 4·0° | 3 5° | 3·5° | 2·6° | 3·3° | 3·4° | 6·8° | 3·6° | 3·5° |
| 8·8° | 52·7° | 55·7° | 57·4° | 56·3° | 53·1° | 49·8° | 44·3° | 49.0° |
| 3·7° | 3·5° | 3·4° | 1·6° | 2·2° | 3·0° | 5·9° | 2·6° | 2·9° |
| 2·5° | 57·9° | 64·4° | 58·3° | 58·1° | 49·3° | 42·4° | 39·2° | 49·1° |
| 0·3° | 17 2° | 13·4° | 19·0° | 10·9° | 22·7° | 33·5° | 25·7° | 19·9° |
| 2·090 | 1 620 | 1·410 | 3·485 | 1·915 | 1·165 | 1·755 | 2·225 | 23·570 |
| 9 995 | 11·615 | 13·025 | 16·510 | 18 425 | 19·590 | 21·345 | 23·570 | — |
| ·380 | ·585 | ·600 | 1·090 | 0·635 | 0·470 | 0·280 | 0·585 | 1·090 |
| 30 | 24 | 25 | 21 | 30 | 7 | 21 | 9 | 21 Aug. |
| 14 | 11 | 12 | 16 | 6 | 9 | 14 | 14 | 167 |
| 85 | 96 | 108 | 124 | 130 | 139 | 153 | 167 | — |
| 81 | 74 | 72 | 70 | 74 | 86 | 86 | 88 | 82 |
| 90 | 84 | 78 | 86 | 83 | 89 | 87 | 89 | 87 |
| 86 | 79 | 75 | 78 | 78 | 88 | 86 | 89 | 85 |
| ·331 | ·356 | ·438 | ·341 | ·363 | ·300 | ·233 | ·212 | ·292 |
| ·333 | ·355 | ·392 | ·383 | ·343 | ·297 | ·237 | ·212 | ·292 |
| ·332 | ·355 | ·415 | ·362 | ·353 | ·298 | ·235 | ·214 | ·292 |
| 47·7° | 49·6° | 55·3° | 48·5° | 50·1° | 45·0° | 38·5° | 35·9° | 43·6° |
| 47·8° | 49·6° | 53·6° | 51·6° | 48·8° | 44·9° | 38·9° | 36·4° | 43·8° |
| 47·7° | 49·6° | 54·5° | 50·1° | 49·5° | 44·9° | 38 7° | 36·1° | 43·7° |

## WIND – FORCE AND DIRECTION.

| | Force. | | | | | Direction to 8 Points of the Compass. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 9 p.m. | Mean. | Maximum | Date of. | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. |
| January ... | 1·9 | 1·6 | 1·7 | 8 | 14 | W | — | — | — | 11 | 8 | 7 | 8 | 9 | 19 |
| February | 1·6 | 1·5 | 1·6 | 8 | 13 | W | 1 | 2 | 4 | 11 | 3 | 6 | 12 | 3 | 16 |
| March..... | 1·1 | 0·9 | 1·0 | 4 | 3 times | NE | 3 | 13 | 2 | 3 | 3 | 6 | 4 | 4 | 24 |
| April ..... | 2·8 | 1·8 | 2·3 | 8 | 6 | W | 1 | 1 | — | 1 | 4 | 9 | 17 | 13 | 14 |
| May..... | 2·1 | 0 6 | 1·4 | 5 | 3 times | SW | 1 | 2 | 2 | 2 | 2 | 14 | 3 | 10 | 26 |
| June ..... | 2·9 | 1·1 | 2·0 | 9 | 25 | NW | - | 5 | 4 | 2 | 3 | 10 | 3 | 18 | 15 |
| July ..... | 2·0 | 1·0 | 1·5 | 5 | 1 | W | — | 2 | — | 2 | 8 | 12 | 13 | 5 | 20 |
| August ... | 2·4 | 1·0 | 1·7 | 5 | 3 times | W | -- | 2 | 2 | 7 | 4 | 3 | 13 | 13 | 18 |
| September | 2·7 | 1·0 | 1·8 | 6 | 10 & 12 | SW | — | 1 | 4 | 10 | 6 | 10 | 6 | 6 | 17 |
| October ... | 1·6 | 1·3 | 1·5 | 7 | 6 | SW | 1 | 1 | — | 6 | 4 | 14 | 5 | 8 | 23 |
| November | 1·3 | 1·5 | 1·4 | 9 | 9 | NW | 3 | 1 | 2 | 5 | 5 | | 10 | 14 | 20 |
| December | 1·4 | 1·4 | 1·4 | 8 | 30 | SW | — | — | — | 11 | 4 | 11 | 6 | 12 | 18 |
| Totals ..... | 2·0 | 1·2 | 1·6 | 9 | 25 June<br>9 Nov. | W | 10 | 30 | 20 | 71 | 54 | 102 | 100 | 115 | 230 |
| Percentages | | | | | | | 1·4 | 4·1 | 2·7 | 9·6 | 7·4 | 13·6 | 13·6 | 15·6 | 32·0 |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | At 9 a.m. or 9 p.m. or both. | | | | | At any Hour. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Welsh Hills, 9 a.m. | | | | | | | | | | | |
| | | | | Visible | | | | | | | | | | |
| | Dew. | Hoar Frost. | Invisible | Clearly | Very clearly | Thunder Storm. | Lightning only. | Thunder only. | Corona. | Gales. | Aurora | Snow. | Hail. | Fog. |
| January ..... | 4 | 3 | 25 | — | — | — | — | — | 1 | 1 | -- | — | 2 | 6 |
| February ... | 4 | 5 | 26 | 1 | — | 1 | — | — | 1 | 3 | — | 3 | — | 1 |
| March..... | 10 | 4 | 26 | 2 | — | — | — | — | — | — | — | — | — | — |
| April ..... | 6 | — | 10 | 6 | 8 | — | — | — | 1 | 4 | — | — | — | — |
| May..... | 8 | — | 17 | 3 | 2 | 3 | — | — | — | — | — | 1 | — | — |
| June ..... | 6 | — | 19 | 8 | 3 | 1 | — | — | — | 3 | — | — | — | — |
| July ..... | — | — | 12 | 12 | 3 | 1 | — | — | — | — | — | — | — | — |
| August ... . | 9 | — | 20 | 2 | 6 | — | — | — | — | — | — | — | — | — |
| September... | 7 | — | 20 | 9 | — | — | — | — | — | — | — | — | — | — |
| October ..... | 12 | — | 25 | 3 | — | — | — | — | — | 1 | — | — | — | 4 |
| November ... | 3 | 3 | 20 | 6 | — | — | — | 1 | — | 3 | — | 2 | 2 | 5 |
| December ... | 5 | 8 | 21 | 3 | 1 | — | — | — | — | 1 | — | 1 | — | 4 |
| Total..... | 74 | 23 | 241 | 55 | 23 | 6 | — | 1 | 3 | 16 | — | 7 | 4 | 20 |

# KINGSLEY MEMORIAL PRIZES

ARE OFFERED UNDER THE FOLLOWING CONDITIONS :—

## CLASS I.

**To any Resident in the Society's District.** – A Prize not exceeding Ten Pounds for the best Collection of Objects, or Essays, or Notes of Observations, or Photographs illustrating the Natural Science of the Society's District.

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All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the Competitors.

Collections, or Essays, or Notes, must be sent to the General Secretaries on or before September 1st, and the awards will be made at the Conversazione next succeeding.

The Committee have the option of retaining successful Collections, &c., for the Society.

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## CLASS II.

**In order to encourage the study of Natural History among younger Students, not exceeding 17 years of age, and residing in the Society's District, *i.e.*, Cheshire and North Wales, the following Prizes and Certificates are offered, viz. :—**

**The FIRST PRIZE in each Class will be ONE GUINEA, together with the Society's Certificate.**

**Collections, Essays, or Photographs, not gaining a Prize, may be awarded Certificates if found to be of sufficient merit.**

1.—For the best account of the Life History of the Cuckoo.

2.—For the best descriptions of the following Trees :—The Oak ; Horse-Chestnut ; Beech ; Lime ; Birch ; and Ash ; together with dried specimens of Leaves, Flowers, and Fruit, of each.

3.—For the best Essay on Coal.

4.—For the four best Photographs of Natural Objects ; such as : Birds, Trees, Flowers, Rocks, Clouds, or Scenery of Cheshire or North Wales.

CONDITIONS.—All the work to be done entirely by the Competitors themselves, who must be under 17 years of age. The Essays and Collections should be sent under a *nom de plume*, accompanied by a sealed letter containing the full name and exact age of the Competitor, to the Hon. Secretaries, on or before September 1st, 1905.

The awards will be made at the Society's Conversazione next succeeding the adjudication.

The Committee do not bind themselves to give the full Prize in case of insufficient merit.

Any further information required can be had on application to the Hon. Secretaries.

# KINGSLEY MEMORIAL MEDAL

ESTABLISHED 1877,

*"For having contributed materially to the promotion and advancement of some branch or department of Natural Science."—Vide* Trust Deed.

1877—MRS. CHAS. KINGSLEY (In Memoriam).
1878—JOHN PRICE, M.A.
1879—SIR PHILIP DE MALPAS GREY-EGERTON, BART., F.R.S.
1880—PROF. T. MCKENNY HUGHES, F.R.S.
1881—D. MACKINTOSH, F.G.S.
1882—ISAAC BYERLEY, M.R.C.S., F.L.S.
1883—GEORGE W. SHRUBSOLE, F.G.S.
1884 ALFRED OSTEN WALKER, F.L.S.
1885—JOHN DAVIES SIDDALL.
1886—HENRY STOLTERFOTH, M.A., M.D.
1887—WILLIAM SHONE, F.G.S.
1888—THOMAS SHEPHEARD, F.R.M.S.
1889—THOMAS RUDDY.
1890—REV CHARLES WOLLEY-DOD, M.A.
1891—ROBERT NEWSTEAD, F.E.S.
1892—OSMUND W. JEFFS.
1893—EDMUND J. BAILLIE, F.L.S.
1894—W. MURRAY DOBIE, M.D., F.R.A.S.
1896—REV. ARTHUR H. FISH, B.A., B.SC.
1897—WILLIAM HENRY DOBIE, M.B.
1899—W. F. LOWE, A.R.S.M., F.I.C., F.C.S.
1900—JOSEPH ARKLE.
1901—THOMAS ALFRED COWARD.
1902—CHARLES OLDHAM.
1903—GEORGE P. MILN.
1904—GEORGE O. DAY, F.E.S.

# KINGSLEY MEMORIAL PRIZES

(OF £5 AND UPWARDS)

ESTABLISHED 1877,

*"For the reward, encouragement, and the advancement of the pursuit and study of Natural Science."—Vide* Trust Deed.

| | | |
|---|---|---|
| 1878 | HELEN SMITH ..... £5<br>EDWIN W. OKELL .... 5 | *Herbarium of Flowering Plants.* |
| 1879—GEORGE SHRUBSOLE .. 5 | | *Carboniferous Fossils.* |
| 1881—E. HOPKINS ..... 5 | | *Cryptogamous Plants.* |
| 1882—GEORGE SHRUBSOLE .. 10 | | *Corals of the Mountain Limestone.* |
| 1886—ROBERT NEWSTEAD .. 10 | | *Hymenoptera.* |
| 1887—JOHN LYON DENSON .. 5 | | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888—LILIAN E. TOMLIN .... 5 | | *Coleoptera.* |
| 1889 | EDITH C. TOMLIN .... 5<br>W. E. SHARP ..... 5 | *Diptera and Hymenoptera (Terebrantia)*<br>*Coleoptera.* |
| 1890—ALFRED J. NIXON .... 10 | | *Land and Fresh-Water Shells.* |
| 1892—W. E. SHARP ..... 10 | | *Coleoptera.* |
| 1896—ALFRED NEWSTEAD £5 5s. | | *Hydradephaga (Water Beetles) and Life Histories of Insects.* |
| 1897—ALFRED NEWSTEAD £5 5s. | | *Life Histories of Insects.* |
| 1900—MISS M. BOWERS..... £5 | | *Collection of Botanical Specimens.* |
| 1901—A. E. GOODMAN . £5 5s. | | *Collection of Photo-Micrographs, with Notes and Observations.* |
| 1902—C. THEODORE GREEN..£10 | | *Collection of* 148 *Microscopical Preparations and* 170 *Herbarium Specimens of Micro-Fungi, together with a descriptive Catalogue and Essay upon same.* |

Amounts less than £5 are also awarded annually.

## Last year Junior Prizes and Certificates were awarded as follows :—

*(a) For the best account of the Life-History of the Common Frog :—*

F. B. SIMPSON, Technical Day School, Chester ..... Prize of One Guinea
JOHN SMEATH THOMAS, Technical Day School, Chester .. Prize of Half-a-Guinea
HERBERT HULSE, Victoria Rd. British School, Chester.... Certificate of Merit
DAVID J. BELL, „ „ „ .... „ „

*(b) For the best descriptions, with sketches, and also carefully dried and mounted specimens, of (a) a Buttercup; (b) a Daisy; (c) a Dandelion :—*

EDITH KEEN, National School, Hoylake ..... .....Prize of Half-a-Guinea
EMILY BIRD, Bromborough Pool Works School ..... „ „
ETHELINDA GRATRIX, „ „ .....Certificate of Merit

*(c) For the best Essay on Salt :—*

LOUIS FENN, Wallasey Grammar School, Liscard .....Prize of One Guinea
JOHN SMEATH THOMAS, Technical Day School, Chester ..Certificate of Merit
HERBERT HULSE, Victoria Rd. British School, Chester.... „ „

*(d) For the four best Photographs of Natural Objects; such as: Birds, Trees, Flowers, Rocks, Clouds, or Scenery of Cheshire or North Wales :—*

F. B. SIMPSON, Technical Day School, Chester .....Prize of One Guinea
FRANCIS MOON HINDE, Wallasey Grammar Sch., Liscard.. Prize of Half-a-Guinea

## "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Accounts for the Year ended 30th April, 1905. **Cr.**

| 1904-1905. | £ | s. | d. |
|---|---|---|---|
| To Balance from last Account | 8 | 7 | 5 |
| „ Dividends on Great Western Railway Company Consolidated Ordinary Stock | 15 | 13 | 9 |
| | £24 | 1 | 2 |
| To Balance in Bank ..... | £7 | 15 | 6 |

| 1904-1905. | £ | s. | d. |
|---|---|---|---|
| By Special Grant to Mr. Robt. Newstead, in recognition of his Drawings of Coccidæ | 5 | 0 | 0 |
| „ Prizes awarded as follows :— The Misses Payne (Senior Prize) ..... | 4 | 4 | 0 |
| Amounts paid for Junior Prizes ..... | 5 | 5 | 0 |
| „ Mr. G. R. Griffith, Printing | 1 | 6 | 0 |
| „ Paid Carriage and Insurance of Kingsley Memorial Die for new Medals ..... | 0 | 6 | 8 |
| „ Engraving Medal for Mr. George O. Day, F.E.S. | 0 | 4 | 0 |
| Balance ..... | 7 | 15 | 6 |
| | £24 | 1 | 2 |

*April 24th*, 1905 Examined and found correct,

GEORGE P. MILN, HON. TREASURER.

J. LYON DENSON, AUDITOR.

# PAST PRESIDENTS

1871 to 1875—Rev. Charles Kingsley, Canon of Chester *(Founder of the Society).*

1875 ,, 1891—Prof. T. McKenny Hughes, F.R.S.

1891-2 Alfred O. Walker, Esq , J.P., F.L.S.

1892-3 His Grace The Duke of Westminster, K.G.

1893 to 1895—W. Murray Dobie, Esq , M.D., J.P , F.R.A.S.

1895 ,, 1897—Henry Stolterfoth, Esq., M.A., M.D., J.P.

1897-8 Thomas Shepheard, Esq., F.R M S.

1898 to 1902—John D. Siddall, Esq.

# SOCIETIES ASSOCIATED

WITH WHICH THE SOCIETY EXCHANGES PUBLICATIONS.

Academia Nacional de Ciencias de la Republica Argentina, Cordoba.

Barrow Naturalists' Field Club.

Brighton and Sussex Natural History Society.

Bristol Naturalists' Society.

British Association (Corresponding Society's Committee).

British Museum (Natural History), Cromwell Road, London, S.W.

Burnley Literary and Scientific Club.

Cardiff Naturalists' Society.

Dudley and Midland Geological and Scientific Society and Field Club.

Epping Forest and County of Essex Naturalists' Field Club.

Glasgow Natural History Society.

Hertfordshire Natural History Society and Field Club

Huddersfield Naturalists' Society.

La Société d'Histoire Naturelle de St. Wladimir á Kiew, Russie.

Leeds Naturalists' Club.

Liverpool Geological Society.

Liverpool Geological Association.

Liverpool Literary and Philosophical Society.

Liverpool Microscopical Society.

Liverpool Naturalists' Field Club.

Liverpool Science Students' Association.

Manchester Field Naturalists' Society.

Manchester Geological Society.

Manchester Microscopical Society.

Menai Society of Natural Science.

Mexico, Geological Institute of.

Northampton Natural History Society.

North Staffordshire Naturalists' Field Club and Archæological Society.

Nottingham Naturalists' Society.

Patent Office Library, 25, Southampton Buildings, Chancery Lane, London, W.C.

"Public Works," St. Bride's House, 24, Bride Lane, Fleet Street, London, E.C.

Scotland, West of, Marine Biological Association.

Smithsonian Institution, Washington City, D.C., U.S.A.

Southport Society of Natural Science.

The Lloyd Library and Museum, Cincinnati, Ohio, U.S.A.

The Missouri Botanical Garden, St. Louis, U.S.A.

United States Geological Survey.

University of Montana, Biological Station, Missoula, Montana U.S.A.

University of Colorado, Boulder, Colorado, U.S.A.

University of Washington, Seattle, Wn., U.S.A.

Vatican Observatory, Rome.

Vienna Natural History Museum.

Yorkshire Naturalists' Union, Leeds.

## HONORARY MEMBERS.

*Those marked (*) have read or contributed Papers at the Society's Meetings.*

*Avebury, The Right Hon. Lord, F.R.S. ...*Down, Farnborough, Kent*
*Ball, Sir Robert S., F.R.S. ..... .....*Observatory, Cambridge*
Barrett, Chas. G., Esq., F.E.S. ..... .....*Tremont, 198a, Peckham Rye, London, S.E.*
Candolle, Mons. Casimir De..... .....*Geneva*
Cannizaro, Prof. ..... .....*Rome*
*Carruthers, W., Esq., F.R.S. ..... .....*The British Museum, South Kensington, London, S.W.*
Credner, Dr. Hermann ..... .....*Leipzic*
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Hooker, Sir J. D., K.C.S.I., F.R.S. ..... .....*The Camp, Sunningdale, Ascot*
*Hughes, Prof. T. McKenny, F.R.S. ..... .....*Trinity College, Cambridge*
*Hull, Prof., F.R.S. ..... .....*20, Arundel Gardens, London, W.*
*Judd, Prof. J. W., F.R.S. ..... .....*Royal College of Science, South Kensington, London, S.W.*
Kelvin, The Right Hon Lord, F.R.S. .....*28, Chester Square, London, S.W.*
Kent, W. Saville, Esq., F.L.S, F.Z.S., F.R.M.S..... .....*Belsito, Melford-on-Sea, Hants.*
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Röntgen, Prof. W. K. ..... .....*Würzburg*
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*Rudler, F. W., Esq., F G.S. ..... .....*Museum of Practical Geology, Jermyn Street, London, S.W.*
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*Strahan, Aubrey. Esq., F.R.S. ..... .....*28, Jermyn Street, London, S.W.*
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Wallace, Dr. A. Russell, F.R.S..... .....*Parkstone, Dorset*

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Russell, Dr. ..... .....*Colwyn Bay*
Sopp, Mr. E. J. B., F.R.Met.S., F.E.S. ...*104 Liverpool Road, Birkdale*
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*Williams, Mr J. Lloyd, B.Sc. ..... .....*University College of North Wales, Bangor*

# NOTICE.

**☞ THE ANNUAL SUBSCRIPTIONS are due on the 1st of May in each year. Members who have not paid for the present year are respectfully requested to forward the amount (Five Shillings) to the Hon. Treasurer, Mr. JOHN SIMON, Chemist, 4, Eastgate Row.**

*** To prevent a recurrence of a frequent misunderstanding, Members are reminded that their names are retained on the Society's Books, and their Subscriptions considered due, until notice has been given to the contrary, according to Rule 8.*

# LIST OF MEMBERS.

*Those marked (*) have read or contributed Papers at the Society's Meetings.*

Abbott, Mr. R. E. ..... Daisy Cottage, Queen's Ferry, Flints.
Acton, Mrs. ..... Grove road, Wrexham
Adair, Major-General ..... 7 Stanley place
Adams, Mr. Beresford ..... Shirley House, Liverpool road
Adams, Mrs. ..... " "
Adams, Mr. H. Dean ..... " "
Adams, Mr. Geo. F. ..... Ashbourne, Victoria road
Ainsworth, Miss F. ..... 4 Nicholas street
Allen, Mr. F. J., B.A., B.Sc. .. 29 Saughall road
Almond, Mr. T. D. ..... Boughton Post Office
Anderson, Mr. H. ..... 26 Hamilton street, Hoole
Andrew, Mr. John R. ..... 18 Bold square
Andrew, Miss R. ..... " "
Andrews, Miss Edith ..... 2 West View, Dee banks
Andrews, Miss Margaret ..... " "
Ankers, Mr. W. H. ..... 6 City road
*Arkle, Mr. J. ..... Diocesan School, George street
Armstrong, Mr. Andrew W. .. 41 Victoria road
Armstrong, Mrs. ..... " "
Arnold, Rev. C. L. ..... Holy Trinity Vicarage, Farehm, Hants.
Asdell, Mr. John Henry ..... 22 Hamilton street, Hoole
Atkin, Mr. Chas. ..... Hoole Council Office, Hoole
Atkin, Mrs. ..... " "
Austin, Miss Ida ..... 27 City road
Ayrton, Mr. A. ..... 4 Liverpool road
Ayrton, Mrs. ..... " "
Ayrton, Mr. Wm. ..... Beccles, Suffolk

Bailey, Mr. H. Grant ..... Crypt Chambers
*Bairstow, Mr. J., F.C.S. ..... Burley, Queen's park
Bairstow, Mrs. ..... " "
Bairstow, Mr. Herbert ..... Thorndene, Tarvin road
Baker, Miss ..... 2 Grey friars

Ballance, Mr. W. ..... Vicarage road, Hoole
*Ballard, Mr. E. G., A.R.S.M. .. Greenfield Cottage, Hoole road
Ballard, Mrs. ..... ,, ,,
Bannister, Miss E. A. M. ..... 63 Foregate street
Barber, Ven. Archdeacon, M.A., F.S.A. ..... } St. Bridget's Rectory
Barber, Mr. Joseph ..... 83 Hoole road
Barbour, Mr. Geo., D.L., J.P. .. Bolesworth Castle, Tattenhall
Barbour, Mrs. ..... ,, ,, ,,
Bardsley, Mr. Richard ..... St. John street
Barker, Mr. C. E. ..... The Town Hall
Barnes, Mr. N. F. ..... Eaton gardens
Barnes, Mr. J. W. ..... Grosvenor Park House, Union street
Barnes, Mrs. ..... ,, ,, ,,
Bassett, Miss C. E. ..... 68 Northgate street
Bate, Mr. J. C. ..... Summerfield, Kilmorey park
Bate, Mrs. ..... ,, ,,
Bates, Mr. W. N. ..... Bull and Stirrup Hotel
Bates, Mrs. ..... ,, ,,
Bax, Mr. P. B. Ironside ..... Blomfield, Bournemouth
Baxter, Mr. Geo. ..... Park view, Panton road, Hoole
Beauchamp, Rt. Hon. The Earl, K.C.M.G. ..... } Madresfield Court, Malvern
Beauchamp, Rt Hon. The Countess ,, ,, ,,
Beckett, Mr. F. J. ..... 18 The Groves
Beckett, Mrs. ..... ,, ,,
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Bedford, Mrs. ..... ,, ,,
Belton, Mr. J. C. ..... Craigside, Sandy lane
Bennett, Mrs. J. Nevitt ..... Addiscombe, Hough green
Bennion, Mr. J. ..... 8 Lorne Street West
Best, Rev. J. D., M.A. ..... Diocesan Training College
Beswick, Miss ..... Sunny bank, Queen's park
*Beveridge, Rev. P. J., M.A., B Sc. (Hons.) .. 7 Bridge place
Beveridge, Mrs. ..... ,, ,,
Billing, Mrs. Alfred ..... Newsteads, Stocks lane
Birch, Mr. H. J. ..... Corville, Liverpool road
Birch, Miss ..... 18 Upper Northgate street
Bishop, Mr. F. S. ..... Benrick, Dee Hills park
Bithell, Mr W. ..... Messrs. Beckett & Co., Eastgate row
Blackburn, Mrs. ..... 32 Bridge street row (W.)
Blackburn, Miss ..... ,, ,,
Blake, Mr. Edgar ..... 23 Cuppin street
Blake, Miss ..... Watergate row
Blayney, Mr. A. ..... 3 City walls (W.)
*Blogg, Rev. H. B, M.A. ..... Frodsham Vicarage, Cheshire
Blomfield, Admiral Sir R. M. } c/o Messrs. Woodhead & Co., 44 Charing Cross, London
Blower, Mr. T. B. ..... 6 The Groves
Boden, Mr. Robt. W. ..... Saighton lodge, Chester
Bolland, Mrs. ..... 46 Hough green
Bolland, Mr. Frank ..... ,, ,,
*Bonnalie, Mr. Fredk. J., L.D.S., R.C.S. .. 4 Abbey square
Bonnalie, Mrs. ..... ,, ,,
Booley, Miss ..... 11 Lorne street
Bostock, Mrs. J. ..... Kingsley Hey, Newton lane
Bourne, Mr. Harold ..... } c/o Miss Golder, 6 St. John's road, Queen's park
Bowers, Mr. J. H. ..... Tyddyn Ucha, Pen-y-bryn, Ruabon
Bowles, Mrs. T. S. ..... The Hollies, Liverpool road
Bowles, Miss Agnes Millicent .. ,, ,,

Boyer, Miss Edith.....2 Paradise row
Bradbury, Mr. R. P. .....Walmore, Dee banks
Brassey, Miss .. .....Rose Hill, Bowdon, Cheshire
Brassey, Mr. Herbert .....The Limes, Curzon park
Brassey, Mrs. ..... .. ,, ,,
Brewer, Miss Anne .....15 Paradise row
Bridge, Dr. J. C., M.A., F.S.A...Christ Church Vicarage
Bridge, Mrs. ..... ,, ,,
Bridge, Miss ..... ,, ,,
Bright, Mr. W. H. .....38 Eastgate row
*Broadbent, Mrs. .....Bache Cottage
*Brown, Mr. F. F., M.A.....Eastgate row
Brown, Miss .....61 Bouverie street
Brown, Miss Daisy ..... ,, ,,
Brown, Mr. W. E. .....33 Parkgate road
Brown, Mrs. ..... ,, ,,
Brown, Mr. W. Ernest ..... ,, ,,
Brown, Mrs. H. T. .....Westminster park, Hough green
Buckland, Miss .....31 Nicholas street
Bull, Mr. H. F.....4 Sunny bank, Queen's park
Bull, Mrs. ..... ,, ,,
Burges, Mr. R. O. .....Whitford, 11 Panton road, Hoole
Burges, Miss J. V. ..... ,, ,, ,,
Burges, Miss L O. ..... ,, ,, ,,
Burness, Mr. Wm. .....Parr's Bank, Ltd., Chester
Butcher, Mr. Jas. .....19 Seller street

*Caldecott, Mr. C. G. .....King street, Wrexham
Caldecott, Miss C. G. ..... { c/o Miss Moss, 14 Hyde gardens, Eastbourne
Cameron, Mrs. .....37 Hoole road
Campbell, Mrs. Pitcairn .....Vicar's cross
Campbell, Mr. A. D. Pitcairn .. ,,
Carr, The Hon. Mrs. .....14 Hough green
Carter, Mr. T. .....171 Boughton
Catherall, Mr. Samuel .....1 Linenhall street
Challinor, Mr. R. .....34 Eaton road
Chalton, Mr. T. W.....Wynstay, Hoole
Chalton, Mrs. ..... ,, ,,
Chamberlain, Mr. T. A. .....Dee Side, Eccleston, Chester
Chambers, Mr. Frank .....13 Curzon park
Chapman, Mr. F. W. .....46 Tarvin road
Chapman, Mrs. ..... ,, ,,
Chapman, Mr. M. D. .....59 Tarvin road
*Chester, The Right Rev. The Lord Bishop of ..... } The Palace, Dee side
Chidley, Mr. T.....14 St. Werburgh street
Churton, Mrs. G. .....96 Watergate flags
Clark, Mr. Sidney.....Upton Villa
Clark, Miss Sybil .....Stanley house
Clark, Miss Eva .....19 Grosvenor street
Clarke, Mr John .....Pasadena, Liverpool road
Clarke, Mr. W. J..... .....The Beeches, Upton park
Clarke, Mr. Ernest ..... .. ,, ,,
Clare, Mr. Horatio .....Grosvenor Schools
*Clay, Miss Beatrice E., B.A. ....The Queen's School
Clayton-East, Mr. G. F. L. ....Bache Hall Lodge
Clayton, Miss Bianca .....17 Vicarage road, Hoole
Clemence, Mr. Thos. .....56 Hough green
Clough, Mr. G. F. .....78 Hough green
Cochrane, Mr. J. G.....9 Grange road, Brook lane

Cockrill, Mr. C. P. .....Briercliffe, Hough green
Cockrill, Mrs. ..... ,, ,,
Coe, Mr. D. .....Howard Lodge, Hamilton street
Coe, Mr. Henry J. .....18 Queen's avenue
*Cole, Mr. R. S., M.A., A.M.I.C.E...Arnold House
Collinge, Mr. James .....Kinnerton Lodge, Chester
Coltart, Mr. C. B.....23 Hough green
Comber, Miss Mary Eleanor ....Woodville, Liverpool road
Comber, Miss Maria E. ..... ,, ,,
Comber, Miss Margaret ..... ,, ,,
Connah, Mr. Jas. ..... 12 Cecilia road, Heath drive, Hampstead, London, N.W.
Conway, Mr. Walter.....8 and 10 Old Bank buildings
Conyers, Mr. W. R.....33 Tarvin road
Cook, Mr. G. Mark .....110 Foregate street
Cook, Mr. R.....7 The Groves
Cook, Miss Alice M. ..... ,, ,,
Cooke, Mr. J. H. .....6 Queen street
Coppack, Mr. Chas. .....Gladwyn, Liverpool road
Coppack, Miss ..... ,, ,,
Coppack, Miss Nellie ..... ,, ,,
Cordery, Miss C. .....St Agnes' School, Caldy, West Kirby
Crane, Mr. H. E. .....Savings Bank House, Grosvenor street
Cresswell, Mr. John, A.I.C.E. ..8 Ash grove, Wrexham road
Cresswell, Mrs. ..... ,, ,,
Cresswell, Miss ..... ,, ,,
Crimes, Mr. W. H. .....167 Boughton
Croston, Mr. J., Junr. .....Holmesdale, Brook lane
Croston, Mrs. ..... ,, ,,
Crowe, Mr. John .....The Waterworks
Cullimore, Mrs. .....Christleton, Chester
*Cummings, Mr. Sidney G. .....6 King's buildings
Curtis, Mr. George M. .....1 Stone place, Hoole

*Darby, Very Rev. J. L., D.D. ..The Deanery
Darby, Mrs. ..... ,,
Darby, Miss ..... ,,
Darby, Mr. Alfred.....Laurel Grove, near Wrexham
Davies, Miss Henrietta.....69 Boughton
Davies, Mr. E. Henry .....19 Francis street
Davies, Mr. Joseph ..... ,, ,,
Davies, Mr. John .....Parr's Bank, Limited, Chester
Davies, Mr. W. L. .....Beechwood House, Canal street
Davies, Mrs. ..... ,, ,, ,,
Davies, Rev. J. T., M.A. .....6 Abbey green
Davies, Mr. W. L. Cameron ....Victoria pathway, Queen's park
Davies, Mrs. ..... ,, ,,
Davies, Mr. Percy Twiston.....Cedar Bank, 20 Liverpool road
Davies, Mr. Arthur .....23 Lord street, Boughton
Davies, Mrs. ..... ,, ,,
Davies, Miss Hazlem .....1 King's buildings
Davison, Mr. George .....4 Chichester street
Day, Mr. John ..... .....Bryntirion, Chichester street
Day, Mrs. ..... ,, ,, ,,
Day, Miss ..... ,, ,, ,,
Delany, Mr. John .....7 Lorne street (South)
Delany, Mrs. ..... ,, ,,
Denson, Mr. W. .....21 Upper Northgate street
Denson, Mrs. ..... ,, ,,
Denson, Miss Adelaide ..... ,, ,,
Denson, Mr. J. Lyon ..... ,, ,,

Denson, Mr. W. H. ..... Westminster park, Hough green
Denson, Mrs. ..... ,, ,,
Denson, Mr. F. R. ..... Abbot's Mount, 33 Liverpool road
Denson, Mrs. ..... ,, ,,
Dew, Mr. W. R. ..... c/o Messrs. Douglas & Minshull, 6 Abbey square
Dickinson, Mr. D. ..... 1 Upton view, Hoole
Dickinson, Mrs. ..... ,, ,,
Dickson, Mr. Geo. A., J.P. .... Springfield, Flookersbrook
Dickson, Mr. J. H. ..... St. Ives, Queen's park
Dickson, Mrs. ..... ,, ,,
Digby, Miss ..... 2 Grey friars
Dixon, Mr. Phillip ..... Modyn House, Liverpool road
*Dobie, Dr. W. M., F.R.A.S., J.P. ..4 Hunter street
*Dobie, Dr. W. H., M.B. ..... 2 Hunter street
Dobie, Mrs. ..... ,, ,,
*Dobie, Dr. Herbert ..... Northdene, Upper Northgate street
Dobie, Mrs. ..... ,, ,, ,,
Dobie, Mr. Douglas ..... 12 Upper Northgate street
Dobie, Mrs. ..... ,, ,,
Dobson, Pastor R. ..... 2 Pyecroft street, Handbridge
Dod, Miss Wolley ..... Edge Hall, Malpas
Dodd, Mr. W. ..... Mayfield Cottage, 7 Vicarage road, Hoole
Dodd, Mr. Henry ..... ,, ,, ,,
Dodd, Mr. John ..... 73 Bouverie street
Dodds, Mr. Arthur W., L.D.S.E. .. Thornleigh, 3 Westminster park
Donald, Mrs. ..... The Cross
Douglas, Mr. C. P. ..... St. Martin's House
Douglas, Mrs. ..... ,, ,,
Dowdall, Colonel A. P. ..... 25 Curzon park
Dowdall, Miss A. ..... ,, ,,
Drinkwater, Dr. H. ..... Wrexham
Ducker, Mr. P. J. ..... George street
Duckworth, Mr. Henry, F.L.S., F.G.S. ..7 Grey friars
Duff, Dr. J. ..... 5 Abbey street
Dufton, Mr. Arthur, M.A., B.Sc. ..5 Eversley park
Dufton, Mrs ..... ,, ,,
Dunning, Mr. J. H. ..... Sandon, Hoole road
Dunning, Mrs. ..... ,, ,,
Dutton, Mr. George F. ..... Aldersey Grammar School, Bunbury, Tarporley
Dutton, Mrs. G. W. ..... Claremont, Vicar's Cross
Dutton, Mr. H. B. ..... Freshfield, 27 Curzon park
Dutton, Mrs. ..... ,, ,,
Dutton, Mr Stanley G. ..... ,, ,,
Dutton, Miss M. ..... 11 Grosvenor road
Dutton, Mr. A. E. ..... 51 Frodsham street
Dutton, Mr. John ..... Littleton Hall Gardens
Dye, Mr. Alfred B. ..... Fairhazel, 30 Bouverie street
Dye, Miss Ethel ..... ,, ,,

Ealand, Mrs. ..... Hovendene, Dee Hills Park
Ealand, Mr. A. N. ..... ,, ,,
*Edwards, Mr. F. G., F.R.C.V.S. ..5 Newgate street
Edwards, Mrs. ..... 59 Tarvin road
Edwards, Mrs. E. Lloyd ..... Bryn Oerog, near Llangollen
Edwards, Mr. George ..... Kops Lea, Dee Banks
Eggers, Miss ..... 42 Hough green
Eggington, Mr. R. H. ..... 32 St. Martin's fields
Eggington, Mrs. ..... ,, ,,
Elliott, Dr. John, B.S., B.Sc. .... 24 Nicholas street
Elliott, Mrs. ..... ,, ,,

Ellis, Mr. R. J. ..... 60 Foregate street
Elphick, Mr. G. Pelham ..... Brook lodge, Brook lane
Elphick, Mrs. ..... " "
Ermen, Mr. C. A. ..... 4 Upper Northgate street
Errington, Mr. J. H. ..... 22 Lightfoot street, Hoole
Evans-Lloyd, Col., J.P. ..... Stanley House
Evans, Mr. Geo. H. ..... The Limes, Lumley road
Evans, Miss ..... Roseneath-on-the-Hill, Bwlchgwyn, near Wrexham
Evans, Mrs. ..... 54 Watergate street
Evans, Miss E. M. ..... " "
Evans, Miss Maria ..... 49 Cheyney road
Evans, Miss Emily ..... " "
Evans, Mr. A. H. ..... St. George's crescent, Queen's park
Evans, Mrs. ..... " " "
Evans, Mr. D. Ernest ..... Inglehope, 14 Vicarage road, Hoole
Evans, Mrs. ..... 27 Hough green
Evans, Miss Violet ..... " "
Ewens, Mr. A. ..... 32 King street
Ewing, Mr. C. A. ..... Rockcliffe, Queen's park
Ewing, Miss Alice Mabel ..... " "
Ewing, Mr. Ch. G. ..... " "
Ewing, Master J. Cecil R. ..... " "

Farmer, Mr. Richard ..... 56 Liverpool road
Farrimond, Mr. F. T. ..... Sunnyside, Boughton
Fennah, Mr. G. H. ..... Watergate row
Fennah, Mrs. ..... " "
Fergusson, Mr. W. ..... The Cairn, Liverpool road
Fergusson, Miss J. M. ..... " "
Ffoulkes, Mr. Thomas B. Junr ..8 Burlington road, Ipswich
Ffoulkes, Mr. Geo. B. ..... 15 Chichester street
Ffoulkes, Miss Jocelyn ..... Kingsley Lodge, Liverpool road
Ffoulkes, Miss H. Jocelyn ..... " "
Finchett-Maddock, Mrs. H. .... Cae Gwyn, Carnarvon
Fish, Mrs. ..... Arnold House, Parkgate road
*Fish, Rev. A. H, B.A, B.Sc. ..... " "
Fish, Mr. Cecil E., B.A., M.B., B.C.(Camb.), M.R.C.S., L.R.C.P.(Lond) ..... Llanbedr Hall, Ruthin, N. Wales
FitzGerald, Dr. W. A. ..... Clare Lodge
Fleming, Mr. T. R. ..... Rowton Grange
Fleming, Mrs. ..... " "
Fletcher, Miss ..... Gleneden, Curzon park
Float, Mrs. S. M. ..... 20 Upper Northgate street
Fluitt, Miss ..... 25 Upper Northgate street
Forster, Mr. W. Angus ..... Belgrave Lodge, Pulford, Chester
Francis, Mr. H. K. ..... 63 Bridge street row
Francis, Miss ..... South Bank, Glan Aber park
Franks, Miss ..... 12 Stanley place
Fraser, Mr. R. ..... Greenbank, Eaton road
Fraser, Miss ..... " "
Frater, Mr. Geo. ..... Grey Holt, Summerhill, near Wrexham
Frater, Mrs. ..... " " "
Freeman, Mr. C. E. ..... Branksome, Brook lane
Freeman, Mrs. ..... " "
Frisby, Miss ..... 16 Chichester street
Frost, Mr. J. G., J.P. ..... Boughton Hall
Frost, Mrs. ..... " "
Frost, Mr. J. M., J.P. ..... Upton Lawn
Frost, Mrs. ..... " "
Frost, Mr. T. Gibbons ..... Mollington Banastre
Frost, Mrs. ..... " "

Gamon, Mr. John .....The Quillets, Liverpool road
Gardner, Mr. E. .....Saighton House, Chester
Garnett, Mrs.....The Rectory, Christleton, Chester
Garnett, Mr. J. W. .....45 Bridge street row
Garnett, Mrs..... „ „
Garside, Mr. Franklin .....Graianfryn, Prestatyn
Gibson, Major .....Buckley, *via* Chester
Gibson, Miss .....2 Paradise row
Gibson, Mr. John .....5 Abbot's nook, Victoria road
Giffen, Mr. J. T. M., F.R.C.S. ..Richmond Hill, Boughton
Gilbert, Mr. Egerton .....21 Eaton road
Gilbert, Mrs. ..... „ „
Giles, Mr. E. S. .....Gowymede, Vicar's Cross
Giles, Mrs. ..... „ „
Glascodine, Miss .....4 King's buildings
Gleadowe, Mr. H. T. .....11 Stanley place
Golder, Mr. Jas. T. .....36 Hough green
*Goodman, Mr. A. E. .....Oakdene, Tarvin road
Goodman, Mrs. W. ..... „ „
Goodhart, Mrs. E. S. .....100 Watergate flags
Gordon, Miss F. F. .....The Limes, 54 Hough green
Gore, Ven. Archdeacon, D.D. ..Bowdon, Cheshire
Gourlie, Rev. N. J. N., M.A. ..The Vicarage, Weston, near Crewe
*Granger, Mr. F. M., M.R.C.S., L.R.C.P.. 18 Nicholas street
Grantham, Rev. H. .....S. Mary's Rectory
Grantham, Miss Gwynydd ..... „ „
Gray, Miss .....6 Lorne street
Greenhouse, Mr. Chas. .....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S., M.B.M.S. .. } 31 Shrewsbury road, Birkenhead
Greig, Mrs.....Anfield, Dee banks, West
Griffin, Rev. C. A. .....The Folly, Flookersbrook
Griffin, Mrs. ..... „ „
Griffith, Mr. G. R. .....Grosvenor street
Griffith, Mr. G. B. .....3 Beaconsfield street
Griffiths, Mr. John .....Elmhurst, 1 St. John's road, Queen's park
*Griffiths, Rev. T. T., M.A., R.N., H.M.S. "Isis" .... } „ „ „
Griffiths, Mr. Robert .....West hey, Hough green
Griffiths, Mrs. ..... „ „
Griffiths, Miss Bessie ..... „ „
Griffiths, Mr. R., Junr. ..... „ „
Griffiths, Mr. W. A.....3 Exton park
Griffiths, Mrs. ..... „ „
Griffiths, Mr. John .....The Hollies, Upton park
Griffiths, Miss ..... „ „
Griffiths, Miss M. J. ..... „ „
Griffiths, Mr. T. H. .....57 Ermine road, Hoole
Grindley, Mr. J. .....3 Eastgate street
Gritton, Mr. Joseph .....The Laurels, Hawarden
Grills, Dr. .....The Asylum, Chester
Gunton, Miss.....2 Church street
Giles, Miss H. .....13 Bath street
Greatbanks, Mr. J. .....Kilmorey, Hoole road

Hallmark, Miss Amy ..... ...2 Waterloo road
Hales, Miss .....Cop House, Sealand road
*Hamilton, Mr. A., M.R.C.S.....16 White friars
Hamilton, Mrs. ..... „
Hamilton, Mr. A. G., M.B. ....23 Hoole road
Hamilton, Mrs..... „ „

Hampson, Mr. R. ..... Halkyn road, Flookersbrook
Hannon, Miss ..... 15 Victoria pathway, Queen's park
Harris, Mr. T. ..... Claremont, Dee banks
Harris, Mrs. ..... " "
Harrison, Mrs. ..... Highfield, Curzon park
Harley, Mr. T. D. ..... 21 Blacon terrace
Harrison, Mr. T. E. ..... 20 Queen street
Harvey, Miss ..... Fern Lea, Stamford Bridge, nr. Chester
Haselden, Mr. J. H. ..... Delamere street
Haswell, Mr. G. H. ..... Queen's park
Haswell, Mrs. ..... " "
Haswell, Mr. W. H. ..... 94 Foregate street
Haswell, Mr Geo. W. ..... 28 Bouverie street
Haswell, Miss F. E. ..... 31 Parkgate road
*Hatch, Mr. Herbert A., B.Sc. ..46 Bridge street row, West
Hatton, Mrs. ..... 1 Lorne street, West
*Hawkins, Mr. J. M. ..... Glan Aber park
Haycock, Rev. H. E. ..... 59 Parkgate road
Henderson, Mr. J. E. ..... 19 Pathway, Queen's park
Henderson, Mrs. ..... 9 Union Walk
Henri, Miss ..... 11 Queen's road, City road
Henshall, Mr. James, Junr. ..... 22 Bouverie street
Heppel, Miss ..... 39 Lord street
Heppel, Mrs. ..... Windsor Lodge, Mickle Trafford
*Hetherington. Mr. T. ..... Engineers' Department, The Post Office, Glasgow
Hewitt, Mr. D. L. ..... 2 Hough green
Higginson, Mr. T. ..... 7 South view, Eaton road
Hignett, Mrs. T. H. ..... Shandon, Hough green
Hignett, Mr. H. Napier ..... " "
Hilton, Mrs. ..... Talbot Hotel
Hincks, Mr. J. W. ..... Brantwood, Brook lane
Hincks, Mrs. ..... " "
Hobday, Mr. J. ..... Alexandra Villa, Liverpool road
Hobday, Mr. Wm Edward ..... 22 The Groves
*Hodge, Mr. James P., C.A. ..... Godstall Chambers
*Hodges, Mr. W. ..... 62 Hough green
Hodgson, Mr. Wm. W. ..... 65 Northgate street
Hodkinson, Mrs. ..... 9 Abbey street
Hodkinson, Mr. E. ..... " "
Hogarth, Mr. T. O., M.I.Mech.E. .. The Lodge, Saltney
Holding, Miss ..... Northgate Lodge, 3 Upper Northgate st.
Holland, Miss ..... 11 Derby place, Hoole road
Holland, Miss ..... 7 Chichester street
Holland, Mr. W. ..... Ashwood, 10 St. John's road, Queen's park
Holland, Mrs. ..... " " "
Holme, Rev. Canon, M.A. ..... Great Budworth, Northwich
Holmes, Mr. J. G., J.P. ..... Belmont, Curzon park
Holmes, Mrs. ..... " "
Holmes, Mrs. L. B. ..... Ashcroft, 27A Hough green
Holmes, Mr. A. T. ..... " "
Holme, Mr. Samuel H. ..... Downswood, Liverpool road
Hope, Mr. H. G., M.A. ..... Sealand view, Canal street
Hopkinson, Mr. Harry ..... 55 Parkgate road
Hopley, Mr. J. H. ..... 6 Northgate street
Hopley, Mrs. ..... " "
Hopton, Mr. W. A. ..... 8 Moss bank, Parkgate road
Hopton, Mrs. ..... " "
Hopwood, Miss ..... The Deanery
Hornby, Mr. Alex. ..... Shipgate House
Hornby, Mrs. ..... "
Horner, Mr. W. ..... 42 Grey Rock street, Liverpool

Hostage, Mr. George B. .....30 Eaton road
Hostage, Mrs. ..... " "
Hostage, Miss .....24 Eaton road
Howard, Mr. F. T., M.A., F.G.S...West Mount, Waverton
Howard, Mrs..... " "
Howson, Rev. J. F., M.A.....Egerton House, Upper Northgate street
Howson, Miss ..... " "
*Howe, Rev. W. Norton, M.A. ..The Parsonage, Mow Cop, Cheshire
Howick, Mr. T. S. Keith ..... 22 St. Martin's fields
Hubback, Miss C. J. M. ..... 67 Bridge street row
Hucknall, Miss M. ..... ..Grosvenor Park House, Union street
Hughes, Mrs. McKenny .....18 Hills road, Cambridge
Hughes, Mr. John.....47 Victoria street, Westminster, London
*Hughes, Mr. T. Cann, M.A., F.S.A...78 Church street, Lancaster
Hughson, Mr. Arthur .....Surveyor, Mollington, Chester
Hughes, Miss Winifred ..... 3 Albion buildings, Milton street
Hughes, Mr. W. H..... ....Moss Bank, Newton-by-Chester
Hull, Mr. G. S. N. ..... ....51 Gladstone avenue
Humphreys, Mr. E. Noel.. .....Caer-y-Cael, Hoole
Humphreys, Mrs. ..... " "
Hunter, Mr. Jas. .....Maisonette, Hough green
Hunter, Mrs. ..... "
Hutton, Mr. F. W. .....53 Greenway road, Runcorn
Huxley, Miss M. E. .....41 Cheyney road
Huxley, Miss Ann..... " "

Illingworth, Mr. F. H.....34 Liverpool road
Illingworth, Mrs. ..... " "

Jack, Mr. A. S.....Belle Vue, 72 Hough green
Jackson, Miss.....52 Hough green
James, Rev. T. D.....Llanerfyl Rectory, Welshpool
*James, Rev. Frank, M.A. .....181 Woodstock road, Oxford
James, Mr. J. F. .....17 Mount Pleasant, Saltney
*Jebb, Mr. G. R., C.E. .. .....Fairyfield, Great Barr, Birmingham
Jefferson, Mr G. A.....Meadow View, 21 Dee Banks
Jefferson, Master H. A. ..... " "
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S. } 2 The Northgate
Jenner, Mr. H. A. .....11 White Friars
Johns, Mr. W. ... .....20 Granville road
*Johnson, Mr. M., L.D.S.I. .... 21 York villas, Lorne street
Johnson, Mr. Thomas C..... 30 Eastgate row
Johnson, Mr. Sidney M. .....18 Bouverie street
Johnson, Mrs Mayo..... ....10 Lorne street
Jolliffe, Mr. H. D.....Kilbroney, Curzon park
Jones, Miss .... ..... 3 Lorne street
Jones, Mrs. Edward ..... c/o Mr. E. B. Jones, Grey friars
Jones, Mr. Jno.....The Spinney, Hunter street
Jones, Mrs..... " "
Jones, Mr. David Brellisford ....11 St. Anne street
Jones, Mr. Owen E., J.P. .....Tynrheol, Amlwch
Jones, Mr. Fred. ..... .....112 Foregate street
Jones, Miss.....2 Hunter street
Jones, Mrs. W. H. .....Cliveden, Hough green
Jones, Miss Gertrude A. ..... " "
Jones, Mrs. Evan .....Bodrenig, Bala, N. Wales
Jones, Mrs. Wm. .....33 Cuppin street
Jones, Mr. Henry .....Gwynedd, 131 Boughton
Jones, Mr. O. R., H.M.I.M. ....5 Spring Gardens, Hoole

Jones, Mr. Robert W.....Cambrian view
Jones, Miss Mima .....3 Eastern pathway, Queen's park
*Jones, Rev. Richard, B.A.....16 Eaton road
Jones, Mr. E. B. .....8 Grosvenor Park road
Jones, Mr. R. H. .....Newton Hall
Jones, Mr. Charles .....50 Princess street
Jones, Mr. W. B. .....The Post-office, Hawarden
Joyce, Rev. G. C., M.A. .....St. Deiniol's Hostel, Hawarden
Joyce, Rev. F. Hayward .....9 Abbey square

Kelsall, Miss .....Abbot's court, Liverpool road
*Kennedy, Mr. J. B. .....Dee Bank House
Kenyon, Mr. G. A., M B. .....Flookersbrook
Kenyon, Mrs. ..... ,,
Kember, Miss M. .....8 The Groves
Killick, Mr. George .....Eaton, Chester
Killon, Mr. R. W. .....16 Egerton street
Killon, Mrs. ..... ,, ,,
Kirkby, Miss .....Fircroft, Hough green
Kirkland, Master Arthur .....c/o Mrs. Kenyon, Flookersbrook
*King, Dr. H. W. .....26 Nicholas street
King, Mrs. ..... ,, ,,
*Kingsley Miss .....Keys, Eversley, Winchfield
Knight, Miss.....8 Eastgate row
Knowles, Mr. E. R.....15 Grosvenor street
Knowles, Miss ..... ,, ,,
Kynnersley, Mr. E. M. Sneyd ..Boughton Lodge

Lacy, Mrs. .....Moore Holme, Neston
Laing, Miss S. C. .....2 Mount Pleasant, Saltney
Lamb, Mr. R. ..... Oak Lea, Hoole
Lamb, Mrs. ..... ,, ,,
Lamb, Mr. R., Junr. .....Yrfon, Granville road
Lamb, Mrs. ..... ,, ,,
Lamont, Mr. A. .....Oldfield road, Heswall
Lanceley, Mr. R. H. .....Victoria road
Latham, Mr. J. S. .....Green bank, Liverpool road
Latham, Mrs. ..... ,, ,,
*Lawrence, Dr. A. .....The Asylum, Chester
Lawson, Mr. J. A. .....57 Egerton street
Laybourne, Mr. J. H. .....21 The Groves
Laybourne, Mrs. ..... ,, ,,
Ledsham, Mr. G. .....Green lane, Tarvin road
Ledsham, Mr. Wm. .....Coal Exchange
Lees, Mr. W., M.R.C.S. .....The Bars
Lewis, Rev. J. S, M.A. .....The Vicarage, Ruabon
Lloyd, His Honour Sir Horatio ..8 Stanley place
Lloyd, Mr. F. Horatio ..... ,, ,,
*LLoyd, Colonel Wilford .....Eccleston Hill, Chester
LLoyd, Mrs. ..... ,, ,,
Lloyd, Miss M. E. .....13 Chichester street
Lloyd, Miss C. .....62 Princess street
Lloyd, Mr. G. .....38 Duke street
Lloyd, Mr. W. H. .....Glenhurst, Hoole road
Lloyd, Mr. T. F. ..... ,, ,,
Lloyd, Mr. Edward ..... ...Meillonen, Hoole road
Lloyd, Mrs. ..... ,, ,,
Lockwood, Mrs. .....7 Queen's park
Lockwood, Miss Amy .....90 Foregate street
Lodge, Mr. Geo. T. .....St. Catherine villa, Lord street
*Longbottom, Mr. F. W. .....Haslemere, Queen's park
Longbottom, Mrs. ..... ,, ,,

Lowe, Miss C. H. ..... Onneley House, Liverpool road
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. ..... 18 Hough green
Lowe, Mrs. ..... ,, ,,
Lowe, Mr. Jas. F., B.A. ..... Dee banks
*Lucas, Mr. A. W., F.G.S. ..... Queen's park
Lund, Mr. R. S. ..... 12 Bridge street
Lutener, Rev. Wm. ..... Beech Holme, 8 Curzon park
*Lysaght, Colonel ..... Watergate House

Macdonald, Mr. G. ..... 3 Abbey square
*Macdonald, Miss Eva, M.A. .... ,, ,,
*Macdonald, Mr G. E., L.D.S.E. .. 10 Bladud buildings, Bath
MacGillycuddy, Major, J.P. .... Bache Hall
MacGillycuddy, Mrs. ..... ,, ,,
Maddocks, Mr Frank ..... 32 Upper Northgate street
Mann, Mr. A., M.D. ..... 18 Newgate street
Mann, Mrs. ..... ,, ,,
*Manning, Mr. J. B. ..... 27 Perryn road, East Acton, London, W.
Marchant, Mr. W. H. ..... 1 Parkgate road
Marchant, Mrs. ..... ,, ,,
Marlor, Mr. Julian ..... Sherwood, Halkyn road, Hoole
Marriott, Mr. J. W. ..... The Grosvenor Museum
Marsden, Miss ..... 6 Grosvenor Park road
Marshall, Mrs. A. ..... Smithfield Cocoa House, 5 Brook street
Marsland, Miss Sarah ..... 43 Saughall road
Marsland, Miss Mary ..... ,, ,,
Martyn, Miss ..... Sandown terrace, Boughton
Massey, Miss ..... 10 Baths street
Mason, Mr. F. B. ..... 39 Liverpool road
Mason, Mrs. ..... ,, ,,
Mathews, Mr. D. H. F. ..... Kilmorey park, Hoole
McKinlay, Mr. J. ..... 37 Ermine road
*McMichael, Mr. J. A., B.A., B.Sc. .. 39 Parkgate road
McMichael, Mrs. ..... ,, ,,
Meacock, Miss ..... White Friars Cottage
Meeson, Mr. W. H. ..... 16 Eastgate row
Mellor, Miss S. ..... Burley, Queen's park
Mill, Miss F. ..... 26 Eaton road
Mill, Miss Frances ..... St. Mary's Rectory
Miller, Mr. Hugh ..... 2 St. John's road Queen's park
Miller, Mrs. ..... ,, ,, ,,
Millett, Mrs. ..... 9 King street
Millington, Mr. C. ..... Victoria House, Victoria road
Millington, Mrs. ..... ,, ,,
Mills, Mrs. ..... 15 Chichester street
Mills, Mr. Edwd. Julian ..... ,, ,,
*Miln, Mr. G. P. ..... Milnholme, Brook lane
Miln, Mrs. ..... ,, ,,
Miln, Mr. T. E. ..... ,, ,,
Miln, Mr. G. Gordon ..... ,, ,,
Minns, Mr. Alfred ..... 10 Marlborough terrace Londonderry
Minshull, Mr. C. H. ..... 5 Lorne street
*Mitchell Rev. J. C., B.D., F.R.A.S. .. Rutland Cottage, Parkgate road
Mond, Mr. Alfred ..... Winnington Hall, Chester
Mond, Mrs. ..... ,, ,, ,,
Monkhouse, Miss M. ..... 8 Lorne street, west
Montgomery, Rev. J. K. ..... Abbot's villas, Liverpool road
Moreton, Mr. T. W. E., M.R.C.S. .. Tarvin
Morgan, Mr. Sydney ..... Malpas, Cheshire
Morgan, Mr. Geo. S. ..... ,, ,,

Morgan, Mr. R. T. .....2 Newgate street
*Morris, The Rev. Canon, D.D., F.S.A { St. Gabriel's Vicarage, 4, Warwick square London, S.W.
Morris, Mr. Henry .....9 Saughall road
Morris, Mr. R. W. .....Riversdale, Hough green
Morris, Miss C. .....Avondale. Halkyn road
Mosford, Mr John .....The Righi, Tattenhall
Moss, Mr. Samuel, M.P.....50 Hough green
Moss, Mrs. ..... " "
Moss, Mr. W. S. .....Haverthwaite, Newry park
Moss, Mr. Wm. Richardson ....The Oaks, Upton, Chester
Moss, Mrs. ..... " " "
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Mostyn, Sir Pyers W., Bart. ....Talacre, Holywell
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Moulton, Mr. John W. .....Ward's terrace, Hoole
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Musgrave, Mr. A. J. ..... " "
Musgrave, Miss ..... " "
Muspratt, Mr. E. J. .....Within Croft, Dee banks
Muspratt, Miss ..... " "

New, Mrs. J. M. .....The Vicarage, Backford
New, Mr. Henry .....14 Crane street
New, Mr. William J. ..... " "
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Newall, Mrs. ..... " "
Newman, Mr. J. E. .....Sunny bank, Queen's park
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Newstead, Mrs. .....Witcombe villa Handbridge
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Niven, Mr James.....8 Seller street
Niven, Miss ..... " "
Niven, Miss M. D. ..... " "
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Nixon, Mr J G. ..... " "
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Okell, Mr. P. H. .....Wisbeach House, Glan Aber park
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Owen, Mr. W J. ..... " "
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Paxton, Miss ..... " "
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Payne, Miss A. ..... " "
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Rogers, Mrs. ..... „ „
Rogers, Mr. C. W. ..... 104 Watergate flags
Rogerson, Mr. G. H. ..... Polefield, Liverpool road
Room, Miss ..... 3 Victoria pathway, Queen's park
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Royle, Mr. T. C. ..... 12 Vernon road, Sealand road
Royle, Mr. W. ..... 20 Bouverie street
Royle, Mrs. ..... „ „
Royle, Mr. J. W. ..... 38 Eastgate row

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Saugster, Mrs. ..... „ „
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Siddall, Mr. W. ..... „
Siddall, Mr. Chas. Kingsley .... „
Siddall, Mr. T. A. ..... „
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Stewart, Mrs. .....13 Stanley place
Stirling, Mr. .....33 Halkyn road
•Stolterfoth, Dr., M.A., J.P. ....1 Grey friars
Stolterfoth, Mrs. ..... "
Stolterfoth, Miss May ..... 66 Hough green
Stolterfoth, Mr. G. H. ..... "
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Stonex, Rev. F. Tilney, M.A. ..The Vicarage, New Brighton
Stonex, Mrs. ..... " "
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Storr, Miss ..... "
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Stubbs, Mr. E. .....Bache Hall Gardens

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Walker, Mrs. ..... " "
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Walley, Mr. F. ..... 6 Abbey square
Walpole, Mr. John E. ..... Holly Bank, Upton park
Ward, Miss ..... Derby House, Hoole road
Ward, Mr. R. P. ..... 4 Hough green
Ward, Mrs. ..... " "
Ward, Mr. J. ..... Burges street, Hoole
Warmsley, Mr. F. J. ..... Abbot's Holme, 69 Liverpool road
Warmsley, Mrs. ..... " " "
Warmsley, Mr. H. L. ..... 20 The Groves
Way, Mr. N. A. E. ..... Bradpole, 57 Liverpool road
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Webster, Mr. L. F. ..... c/o Mrs. Williams, 15 Cheyney road
Webster, Miss Amy B. ..... 2 Nicholas street
Webster, Mr. M. S. ..... 14 St. John's road, Queen's park
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Wedge, Mr. S. T ..... 10 Paradise row
Weldon, Mr. T. T. ..... 16 Queen's road
Welford, Mr. H. T. ..... 17 Cheyney road
Welford, Mrs. ..... " "
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Welsby, Mrs. ..... " "
*Welsh, Mr. John, M.R.C.S, L.R.C.P., F.C.S. . 43 Tarvin road
Welsh, Mr. Wm. ..... 34 Tarvin road
Westminster, Her Grace Katherine, Duchess of. . Combermere Abbey, Whitchurch (Salop)
Westminster, His Grace The Duke of. . Eaton, Chester
Westminster, Her Grace The Duchess of. . Eaton, Chester

Wheatley, Rev. T. .....18 Eaton road
*Whichello, Mr. H.,L.R.C.P.,M.R.C.S. Sunnyside, Tattenhall, Chester
Whitworth, Mr. Samuel .....39 Tarvin road
Wigg, Mr. Walter J. .....The Firs, Newton
Wilbraham, Miss E. .....5 King's buildings
Wilbraham, Miss F. ..... ,, ,,
Wilkinson, Mr. R. .....51 Cambrian view
Wilkinson, Miss..... ,, ,,
Williams, Mr. J. E. .....21 Pepper street
Williams, Mr. John .....Blue Bell bank, Saltney
Williams, Miss .....65 Tarvin road
Williams, Mr. R. J. .....8 Eaton road
Williams, Miss Aldersey .....100 Watergate flags
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Williams, Miss Carrie ..... ,, ,,
Williams, Mr. Lewis, M.D.....67 Hoole road
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Williams, Miss E. F. .....1 Paradise row
Williams, Miss Pattie .....51 Parkgate road
Williams, Mr R. G. .....Abbey Chambers. St. Werburgh street
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Wolfenden, Mr. A. .....21 Hough green
Wolfenden, Miss Marion..... ,, ,,
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Wood, Miss E. .....c/o Miss Birch, 14 Liverpool road
Woodall, Mr. Henry B. .....Roe Elwy, St. Asaph
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Woolliscroft, Miss..... ,, ,,
Wright, Rev. Harold H., M.A...Precentory, Abbey street
Wright, Mrs ..... ,, ,,
Wylde-Browne, Mr. Harry, M.A. . 4 Hough green
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Wynne, Mr. J. H. .....49 Tarvin road
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Wynne, Mr. John .....Elm Bank, Rowton, Chester

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Yerburgh, Mrs. ..... ,, ,, ,,

BRITISH MUSEUM
NATURAL HISTORY
PRESENTED
5 JUL. 1905

CHESTER:
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MDCCCCV.

17 JUL 1906

# CHESTER SOCIETY
## of
# NATURAL SCIENCE LITERATURE & ART

FOUNDED BY CHARLES KINGSLEY

1871

THIRTY-FIFTH

ANNUAL REPORT

& PROCEEDINGS

FOR THE YEAR

1905-1906.

## THE LIBRARY

Is open to the Members Daily from 10 a.m. to 4 p.m.; and on Thursdays (from October to May) also from 6 p.m. to 9-30 p.m.

☞ A copy of the New Library Rules is given on page 14.

*** **The Catalogue of Books in the Society's Library may be obtained at 4, Eastgate Row; or from the Museum; price 3d. each.**

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*Special attention is directed to the List of Lepidoptera found in Cheshire, Flintshire, Denbighshire, Carnarvonshire, and Anglesea (Proceedings No. V.) which has recently been published by the Society. Copies may be obtained from the Curator, at the Museum, price 2/6 each (Post free 2/8).*

# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY 1871).

## THIRTY-FIFTH

# ANNUAL REPORT

INCLUDING

## STATEMENT OF ACCOUNTS, &c.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art, by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Eight Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any Candidate for Membership of the Society, with those of a proposer and a seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That Junior Candidates between the ages of 12 and 21 shall be admitted, at a subscription of 2/6 per annum, to all the privileges of the Society, excepting that of voting.

7.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

8.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each—except to the Annual General Meeting, to which Members only are admitted.

9.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

10.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

11.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

12.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

13.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

14.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

15.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement made up to the end of April, and duly audited, shall also be submitted, and read if desired.

16.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

17.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

18.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

19.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1906-1907.

## President:

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## Vice-Presidents:

Prof. T. McKENNY HUGHES, F.R.S.
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W. M. DOBIE, Esq., M.D., J.P., F.R.A.S.
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G. R. GRIFFITH, Esq.
J. D. SIDDALL, Esq.
Rev. A. H. FISH, B.A., B.Sc.

## Officers of Sections:

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Chairman—Mr. J. D. SIDDALL ... ... ... ... 23, *Eaton Road*
Secretary—Mr. A. E. GOODMAN ... ... ... ... *Oakdene, Tarvin Road*

### ZOOLOGICAL.

Chairman—Dr. W. HENRY DOBIE ... ... ... 2, *Hunter Street*
Secretary—Mr. W. F. J. SHEPHEARD, F.C.S. ... *Bridge Street Row*

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Secretary—Mr. EGERTON GILBERT... ... ... 21, *Eaton Road*

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Secretary—Mr. J. BAIRSTOW, F.C.S.... ... ... *Burley, Queen's Park*

### MICROSCOPICAL.

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Secretary—Mr. M. JOHNSON, L.D.S.I. ... ... 21, *York Villas, Lorne Street N.*

### PHOTOGRAPHIC.

Chairman—Dr. STOLTERFOTH ... ... ... ... 1, *Grey Friars*
Secretary—Mr. FRANK SIMPSON ... ... ... 10, *Grosvenor Street*

### LITERATURE.

Chairman—Rev. A. H. FISH, B.A., B.Sc. . . ... *Arnold House*
Secretary—Dr. J. T. ROBERTS ... ... .. ... *Dorchester House*

### ASTRONOMICAL.

Chairman—Dr. W. M. DOBIE, F.R.A.S. ... ... *Kirkton House, 4, Hunter Street*
Secretary—Mr. F. W. LONGBOTTOM, F.R.A.S.... *Haslemere, Queen's Park*

### ART.

Chairman—The Very Rev. Dr. DARBY ... ... *The Deanery*
Secretary— ... ...

## Hon. Treasurer:

Mr. JOHN SIMON, 4, *Eastgate Row.*

## Hon. Secretaries:

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*General*—Mr. G. P. MILN, *Milnholme, Brook Lane*
Mr. W. F. J. SHEPHEARD, F.C.S., *Bridge Street Row*

## Hon. Librarian:

Mr. ALFRED NEWSTEAD, *The Grosvenor Museum.*

## Committee:

The above Officers *(Ex-officio)*
AND

Miss BEATRICE CLAY, B.A.
Rev. J. L. BEDFORD, M.A., F.L.S.
Mr. J. DAY
Mr. J. LYON DENSON
Dr. GRANGER
Dr. HAMILTON
Dr. RANDALL JACKSON
Dr. KING
Mr. J. A. McMICHAEL, B.A., B.Sc.
Mr. R. NEWSTEAD, A.L.S., F.E.S.
Mr. W. SHONE, F.G.S.
Dr. JAMES TAYLOR

## Hon. Auditors:

Mr. BERESFORD ADAMS. Mr. E. NOEL HUMPHREYS, C.A.

## Curator:

Mr. ALFRED NEWSTEAD, *The Grosvenor Museum.*

## Assistant Secretary:

Mr. H. NEW.

## Representatives of the Society upon the Grosvenor Museum Management Committee:

Rev. A. H. FISH, B.A., B.Sc.
Mr. J. D. SIDDALL
Mr. G. P. MILN
Mr. JOHN SIMON
Mr. J. BAIRSTOW, F.C.S.
Mr. F. W. LONGBOTTOM, F.R.A.S.

## HON. SECRETARIES' REPORT.

YOUR COMMITTEE have pleasure in presenting a satisfactory Report for the past Session.

During the Summer months, Excursions and Field Meetings were held as follows :—

1905.

May 18th—Newton and Upton Nurseries.

,, 25th—Evening Meeting at the Grosvenor Museum.

June 7th—The "Old Parsonage" Gardens, Gresford.

,, 21st—Erddig Hall and Park, Wrexham.

,, 24th—Llangollen (Photographic Excursion).

,, 28th—The Meadows and Heron Bridge, Chester (Entomological Ramble).

July 5th—Brewer's Hall and Saltney Clay-pits (Geological Ramble).

,, 13th—Delamere Forest; for the Comma Wood and Oakmere.

,, 19th—Snowdon and Bettws-y-Coed (Annual Excursion).

,, 26th—Upton Pits, Chester (Microscopical Ramble).

Sep. 6th—Raby Mere (Fungus Foray and Botanical Excursion).

,, 13th—Engineering Works of the L. and N.-W. Railway Co., at Crewe).

,, 20th—Second Evening Meeting at Grosvenor Museum.

The attendance of Members at these was a fair average in comparison with recent years, but it is evident that Members, generally, are now taking a greater interest in the Winter Lectures; the attendance at these being considerably above the average. In fact, the Lecture Theatre has, on several occasions, proved to be too small for the number of Members who presented themselves for admittance.

A gratifying feature in connection with these Winter Meetings is that the Lecturers were drawn, chiefly, from our own list of Members.

Your Committee further note with pleasure the increasing number of young Members who attend and interest themselves in the various subjects dealt with at

these Meetings, and they trust that the new rule—admitting juniors—will give encouragement to them to become active workers in the various branches of Natural Science.

The following is a summary of the Lectures and Sectional Meetings during the past Winter Session :—

## GENERAL MEETINGS AND LECTURES.

1905.

Oct. 11th—Annual Conversazione in the Town Hall.

„ 19th—"The Development of the British Navy"—MR. J. B. KENNEDY.

Nov. 2nd—"The Recent Total Solar Eclipse"—
MR. F. W. LONGBOTTOM, F.R.A.S.

„ 17th—"A Trip to the Victoria Falls in Central Africa"—
MR. J. D. CARTWRIGHT, M.L.A., of Cape Town.

1906.

Jan. 4th—"Our Faithful Companions" (Dogs and Cats), Afternoon and Evening Lecture—MR. FRANK SIMPSON.

„ 11th—"How Seamen find their way across the Ocean"—
REV. T. T. GRIFFITHS, M.A., R.N.

Feb. 1st—"The Study of Animals in Italian Painting"—
REV. W. NORTON HOWE, M.A.

Mar. 1st—"Flies and other Animals as carriers of Disease"—
MR. R. NEWSTEAD, A.L.S., F.E.S., &c.

Apr. 5th—"Recollections of my Indian Rambles"—
MR. JOSEPH THOMPSON.

*** The above Lectures were fully illustrated with Lantern Slides, &c.

„ 26th—"Some descriptive Notes on the Stivens' Collection of Birds" (now in the Museum)—

*(a)* British Species, MR. R. NEWSTEAD, A.L.S, &c.;

*(b)* Exotic Species—THE CURATOR (Mr. A. Newstead).

## SECTIONAL MEETINGS.

### BOTANICAL.

1906.

Jan. 25th—"Variation and Heredity," by
DR. ERIC DRABBLE, F.L.S., University of Liverpool

Mar. 22nd—"Hybrids and Mendel's Law," by
DR. ERIC DRABBLE, F.L.S., University of Liverpool.

## ZOOLOGICAL.

1905.

Nov. 30th—"The Distribution and Dispersal of Animals," by MR. CHARLES OLDHAM.

1906.

Feb. 22nd—"Zoological Notes and Observations on the Past Year," by DR. HENRY DOBIE, MR. J. ARKLE, MR. J. THOMPSON, MR. R. NEWSTEAD, and THE CURATOR (Mr. Alfred Newstead), with actual specimens.

## GEOLOGICAL.

1906.

Jan. 18th—"The Origin of the Present Physical Features of South Wales," by MR. F. T. HOWARD, M.A., F.G.S.

Mar. 29th—Conclusion of the above Subject, by MR. F. T. HOWARD, M.A., F.G.S.

## NATURAL PHILOSOPHY.

1905.

Nov. 9th—"The History, Manufacture, and Uses of Coal Gas," by MR. JOHN C. BELTON (Mem. Soc. Eng. and Instit. Gas Eng.).

1906.

Feb. 15th—"Steel"; how the demands of the Engineer have been met by the Metallurgist, by MR. J. KENT SMITH (Tech. and Consult. Chemist).

## MICROSCOPICAL.

1905.

Dec. 7th—Practical Demonstration in Section Cutting; Staining and Mounting; Diatom Mounting, &c., by MEMBERS of the Section.

## PHOTOGRAPHIC.

1905.

Oct. 26th—"Summer Outings with the Natural Science Society," and "Mold and The Loggerheads," by MR. F. SIMPSON.

1906.

Mar. 8th—Lecturettes—"The Eclipse of 1905; Micro-Photography, &c., by DR. H. STOLTERFOTH, J.P.

"The River Dee," by MR. F. SIMPSON.

Apr. 19th—"Chester Cathedral," by MR. F. SIMPSON.

In addition to the above, nine fortnightly Workers' Meetings were held for Lectures and Practical Demonstrations, which were contributed to by MESSRS. W. H. ANKERS, J. A. MCMICHAEL, B.A., B.Sc., W. G. SCHRÖDER, A.R.C.A., F. SIMPSON, and others.

## LITERATURE.

1905.
Nov. 23rd—"Sir Walter Scott," by MR. JAMES STIRLING.

1906.
Feb. 8th—"Ancient and Modern Classics, and their appreciation," by MR. ARTHUR LYON, M.A. (Hawarden).

## ASTRONOMICAL.

1905.
Dec. 14th—"Time and Time-keepers," by REV. E. A. HUTTON, M.A., (Vicar of Hargrave).

1906.
Mar. 15th—"Half-an-hour with the Nebulæ," by MR. F. W. LONGBOTTOM, F.R.A.S.

NOTE.—Most of the foregoing Sectional Meetings were freely illustrated by Lantern Slides, &c.

A perusal of the Treasurer's Balance Sheet will show that the funds of the Society are in a satisfactory condition; there being a credit balance of £13 7s. after payment of all expenses.

Since the last Annual General Meeting, eighty new Members have joined the Society; but, on the other hand, the losses by deaths, removals, and resignations, amount to 94; leaving the total number of Members to date 1,015.

Your Committee have met thirteen times, during the past year, for the transaction of the Society's business.

Those Members of the Committee, who represent the Society on the Museum Management Committee, have also been faithful in guarding the interests of the Society at the Monthly Meetings of the Board of Management.

GEORGE P. MILN, } *Hon. Gen.*
W. F. J. SHEPHEARD, } *Secretaries.*

GROSVENOR MUSEUM,
3RD MAY, 1906.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1906.

| Dr. | £ s. d. | £ s. d. |
|---|---|---|
| By Balance from last year ... ... ... ... | | 5 0 4 |
| ,, 903 Subscriptions for year 1905-6 at 5/- ... ... | 225 15 0 | |
| ,, 8 Arrears ,, 1904-5 at 5/- ... ... | 2 0 0 | |
| ,, 2 ,, ,, 1903-4 at 5/- ... ... | 0 10 0 | |
| | | 228 5 0 |
| Subscriptions unpaid—29 for 1904-5 £7 5/- } £9 15/- | | |
| ,, ,, 10 for 1903-4 £2 10/- } | | |
| ,, Gross Receipts from Excursions— | | |
| To Old Parsonage, Gresford ... ... ... | 6 19 9 | |
| ,, Erddig Park, Wrexham ... ... | 8 1 9 | |
| ,, Delamere Forest ... ... ... | 1 12 4½ | |
| ,, Bettws-y-Coed (Annual Excursion) ... | 7 13 6 | |
| ,, Raby Mere ... ... .. ... | 0 8 3 | |
| ,, Crewe Engineering Works ... .. | 9 13 9 | |
| | | 34 9 4½ |
| ,, Lectures, Evening Meetings, &c.— | | |
| Conversazione ... ... ... ... | | 16 12 10 |
| Mr. J. B. Kennedy ... ... ... ... | 2 3 0 | |
| Mr. F. W. Longbottom ... ... ... | 0 9 6 | |
| Mr. J. D. Cartwright ... ... ... .. | 1 5 0 | |
| Mr. C. Oldham ... ... ... ... | 0 1 0 | |
| Mr. J. Stirling ... ... ... ... | 0 1 0 | |
| Mr. Eadie ... ... ... ... | 0 1 0 | |
| Microscopical Demonstration .. ... | 0 1 0 | |
| Rev. E. A. Hutton ... ... ... | 0 1 0 | |
| Mr. F. Simpson's two Lectures ... ... | 2 15 0 | |
| Rev. T. T. Griffiths ... ... ... ... | 0 3 0 | |
| Rev. W. N. Howe ... ... ... ... | 0 4 0 | |
| Photographic Lecture ... ... ... | 0 1 0 | |
| Mr. Longbottom's Second Lecture ... .. | 0 2 0 | |
| Mr. F. T. Howard ... ... ... ... | 0 1 0 | |
| Mr. Joseph Thompson ... ... ... | 0 1 0 | |
| Mr. F. Simpson's Second Lecture ... ... | 0 1 0 | |
| | | 7 10 6 |
| Sale of List of Lepidoptera ... ... ... | | 0 2 6 |
| | | £292 0 6½ |

| Cr. | £ s. d. | £ s. d. |
|---|---|---|
| To Museum Management Committee ... ... | | 75 0 0 |
| ,, Natural History Museum and Library ... ... | | 22 2 6½ |
| ,, Postages ... ... ... ... ... | | 28 12 6½ |
| ,, Printing, Stationery, and Advertising ... ... | | 52 19 6 |
| ,, Expenses in connection with Excursions— | | |
| Messrs. Dicksons' Nurseries ... ... | 0 5 0 | |
| Old Parsonge, Gresford ... ... ... | 4 18 0 | |
| Erddig Park, Wrexham ... ... ... | 7 13 0 | |
| Delamere Forest ... ... ... ... | 1 8 7½ | |
| Bettws-y-Coed ... ... ... ... | 7 13 0 | |
| Raby Mere ... ... ... ... .. | 0 19 2 | |
| Crewe Engineering Works ... ... ... | 8 1 11 | |
| | | 30 18 8½ |
| ,, Lectures, Evening Meetings, &c.— | | |
| Conversazione ... ... ... ... | | 19 10 9 |
| Photographic Exhibition ... ... ... | 0 10 0 | |
| Mr. J. D. Cartwright ... ... ... | 3 3 0 | |
| ,, ,, ,, ... ... ... | 0 6 6 | |
| Dr. Drabble, two visits ... ... ... | 0 9 10 | |
| Mr. Joseph Thompson ... ... ... | 1 14 0 | |
| | | 6 3 4 |
| ,, Salary to Assistant Secretary ... ... ... | | 15 0 0 |
| ,, Donations— | | |
| New Library Fund ... ... ... ... | 5 0 0 | |
| ,, ,, half additional expenses ... | 0 11 2 | |
| Photographic Section—towards purchase of Lantern ... ... ... ... ... | 5 0 0 | |
| | | 10 11 2 |
| ,, Subscriptions— | | |
| Ray Society ... ... ... ... ... | 1 1 0 | |
| Royal Photographic Society ... ... ... | 1 1 0 | |
| Palæontographical ,, ... ... ... | 1 1 0 | |
| | | 3 3 0 |
| ,, Lantern Account ... ... ... ... | | 12 12 0 |
| ,, Collecting outstanding Subscriptions ... ... | | 2 0 0 |
| Balance in hand ... ... | | 13 7 0 |
| | | £292 0 6½ |

Examined with the Accounts and Vouchers relating thereto and found to be correct. shewing a balance of £13 7/- in the hands of the Hon. Treasurer (Lloyd's Bank separate Account).

BERESFORD ADAMS,
E. NOEL HUMPHREYS, A.C.A. } Hon. Auditors.

Chester, 30th April, 1906.

# CURATOR AND LIBRARIAN'S REPORT.

In comparison with last year's Report (1904-5), the additions to the Society's Museum shows a decided increase, and your Curator has pleasure in stating that many species are new to the Society's Collections, and also of great rarity.

The additions to the Birds include the following:—Chough *(Graculus graculus)*; Hobby Hawk *(Falco subbuteo)*; Osprey *(Pandion haliaëtus)*; Glaucous Gull *(Larus hyperboreus)*; Snowbunting *(Plectrophenax nivalis)*; Goldfinch *(Carduelas elegans)*; and several varieties of Pheasant *(Phasianus colchichus)*. These examples formed a part of that portion of the collection of British Birds which was made by the late Mr. J. C. Stivens, and presented to the Society's Museum, in January of the present year, by the Representatives of Mr. Stivens' family. These examples have been removed from the cases in which they were originally mounted, and placed in the classificatory series of the Society's collection, together with as full a record as it was possible to obtain.* The remaining portion of this collection, and also the extensive collection of exotic birds, are the property of the Management Committee. A variety of the Kestrel Hawk *(Falco tinnunculus)* and Blue Tit *(Parus cæruleus)*, are worthy of comment. One new Life-history Group of the Dipper *(Cinclus aquaticus)* has been completed during the past year from specimens and material presented by Colonel Bryan G. Davies-Cooke, of Colomendy, Mold. Two other Bird Groups, viz.:—The Puffin *(Fratércula ártica)* and the King Fisher *(Alcedo ispida)*, are in course of preparation; these, your Curator hopes to complete during the ensuing year.

A specimen of the Common Seal *(Phoca vitulina)* was purchased by the Society from some Handbridge Fishermen, who caught it in the Dee near the old Cheese Stage, on November 19th, 1905. According to Messrs. Oldham & Coward's list of the "Mammalian Fauna of Cheshire and North Wales," dated 1895, this species has occasionally been captured in the Dee and Mersey. The specimen has been preserved and added to the Society's Collection, and your Curator has pleasure in stating that it is an important addition, being the only representative of this Group of Seals *(Pinnipedes)* contained in the local collections. Unfortunately, the specimen has suffered somewhat from a form of skin disease, but the specimen is perfect in every other respect.

Many rare species have been added to the Society's collections of *Lepidoptera* and *Coleoptera*, including several species new to the Society's district, to which Messrs. J. Arkle, Geo. O. Day, Brockton Tomlin, and your Curator, have materially contributed.

The Education Authorities have arranged with the Museum Management Committee for a further course of Nature-study lessons, to be given by your Curator, to children selected from the Higher Standards of the

* The records of the rarer Birds were given, *verbatim*, to Mr. R. Newstead, by the late Mr. Stivens, on October 3rd, 1903; and Mr. Newstead handed over his MSS. for the Society's use and reference.

Elementary Schools of this City. The course commenced on April 23rd, 1906, and will be continued over a period of eighteen weeks. The subjects chosen are as follows :—

1. Common Mosquitoes.
2. Silk-producing Moths.
3. Common Moths of our Gardens and Hedgerows.
4. Familiar Wild Birds (Part I.)
5. Familiar Wild Birds (Part II.)
6. The Fox, Hare, and Hedgehog.

The number of children attending each lesson varies from 30 to 40 ; and, as on the previous occasions, the boys attend on Monday afternoons ; and the girls on Thursdays in each week. The lessons are fully illustrated by specimens selected from the Society's Museum ; by living examples whenever it is possible or practicable to procure them ; and also by lantern photographs.

## LIST OF ADDITIONS.

MR. J. ARKLE—23 species of *Lepidoptera ;* 2 species of *Coleoptera.*

THE BRITISH ASSOCIATION—Copy of the Casts of the Typical Footprints from the Keuper sand-stone.

MR. R. L. BARKER, J.P.—Water Rail *(Rallus aquaticus).*

MR. L. BEBBINGTON—Little Grebe *(Podiceps minor).*

MRS. ALFRED CLEMENCE—Egg of domesticated Duck (exceptionally dark-green form).

THE REPRESENTATIVES OF THE LATE MR. J. C. STIVENS—Chough *(Graculus graculus)* ; Hobby Hawk *(Falco subbuteo)* ; Osprey *(Pandion haliaëtus)* ; Snowbunting *(Plectrophenax nivalis)* ; Goldfinch *(Carduelis elegans)* ; Glaucous Gull *(Larus hyperboreus)* immature.

COLONEL BRYAN G. DAVIES-COOKE—Hawfinch *(Coccothraustes vulgaris).*

THE CURATOR—1 specimen of Snake Pipe Fish *(Syngathus anguineus)* ; 5 species of Plant Bugs *(Hemiptera)* ; 2 species of *Hymenoptera* ; 1 species of *Lepidoptera* ; 2 species of *Coleoptera* ; 3 species of Mosquitoes.

MR. J. H. DAVIES—1 species of *Lepidoptera.*

MR. GEO. O. DAY—73 species of *Lepidoptera* ; 100 species of Birds Eggs.

MR. RICHARD FARMER—Light-fawn variety of Kestrel Hawk ; Barn Owl ; Immature Cuckoo.

MR. J. FISHER—Bone of Mammal inserted in portion of an oak tree.

DR. and MRS. GRANGER—43 species of dried Ferns.

MR. J. HARSH—Larva of *Acherontia atropos.*

MR. J. HINDLEY—Knot *(Tringa canutus),*

MR. E. M. JONES—Variety of Stoat *(Mustela erminea).*

THE MISSES DORA and NITA KING—Woodcock *(scolopax rusticola).*

MR. R. LEE—Larva of *Acherontia atropos.*

MR. T. G. LOVE—1 species of *Lepidoptera.*

MR. W. F. LOWE—Sea Mouse *(Aphrodite aculeata).*

MISS MEACOCK—Spotted Salamander *(Salamandra maculosa).*

THE REV. J. M. NEW—Larva of *Orgyia antiqua.*

MR. NIXON—Grass Snake *(Tropidonotus natrix).*

MR. CHAS. OLDHAM—Crayfish *(Astacus fluviatilis).*

MR. E. PRICE—1 species of *Lepidoptera.*

MR. J. D. SIDDALL—1 species of *Lepidoptera.*

MR. LESTER SMITH—1 species of *Hymenoptera*; 1 species of Fungi.

MR. A. A. TATLER—1 species of *Mollusca*; and various specimens of Minerals.

MR. BROCKTON TOMLIN—11 species of *Mollusca*; 102 species of *Coleoptera.*

MR. JOHN WEAVER—Blue Tit *(Albino).*

DR. J. R. WILLIAMS—2 specimens of Dentrith.

MRS. PARK-YATES—Life history of a species of *Crabro*, bred by the Curator.

Purchased—Specimen of Common Seal *(Phoca vitulina).*

Purchased—Specimen of Convolvulus Hawk Moth *(Sphinx convolvuli).*

## ADDITIONS TO THE SOCIETY'S LIBRARY 1905-1906.

Alder, Joshua, and Hancock, Albany. "The British Tunicata," 1905, Ray Society.

"Astronomical, Memoirs of Royal Society," Vol. LV. (Appendix), Vol. LVII., Parts 1 and 2, 1905. *Donor*, Dr. W. M. Dobie.

Barrow. Naturalists' Field Club, Vol. III. (1882), Vol. IV. (1883), Vol. VIII. (1893), Vol. XII. (1897).

Bothamley, C. H. "Manual of Photography." *Donor*, Mr. J. A. McMichael.

Bristol. Naturalists' Society, Proceedings 1905.

British Association, Report of, 1904.

Burnley Literary and Scientific Club, Transactions 1905.

Cash, James. "British Freshwater Rhizopoda and Heliozoa," Vol. I., 1905, Ray Society.

Cardiff. Naturalists' Society, Transactions, Vol. XXXVII., 1904.

Chester. Society of Natural Science, Annual Report, No. 34, 1904-5.

Coward, T. A. and Oldham, C. "Notes on the Birds of Anglesea," 1905. *Donors*, The Authors.

Donne, Alicia. "More Peeps into Bird Life." *Donor*, Mr. William Shone.

Dorset. Proceedings of Natural History and Antiquarian Field Club, Vol. XXV., 1904. *Donor*, Mr. Thomas Shepheard.

Ealing. Scientific and Microscopical Society, Report and Transactions 1904-5.

"Entomologist," 1905.

Essex. "Naturalist," Vol. IV., Nos. 10, 12, 1890; Vol. VIII., Nos. 1, 5, 6, 10—12, 1894; Vol. IX., Nos. 1, 6, 7, 14, 15, 22—24, 1895-6; Vol. X., Nos. 1, 4, 7, 12, 1897; Vol. X., Nos. 13, 24, 1898; Vol. XI., Nos. 1, 12, 1899; Vol. XI., Nos. 13, 24, 1900; Vol. XII., 1902; Vol. XIII., Nos. 1, 2, 3, 1903; Vol. XIII., Nos. 4, 7, 1904; Vols. XIII. and XIV., Nos. 1, 2, 3, 1905.

Fish and Fisheries, Commission of, U.S.A., 1896, 1899, 1900, 1901, 1903. *Donor*, Mr. J. B. Feilding.

Geologists' Association, Proceedings of, Vol. XIX., 1905.

Geological Society, Proceedings of the Liverpool, Vol. X., Part I., 1905.

Geological Survey, Department of the Interior of the U.S.A., 1895-04. *Donor*, Dr. H. Stolterfoth.

Hertfordshire Natural History Society, Transactions, Vol. XII., Parts 3 and 4, 1904-05.

Hertfordshire Natural History Society and Field Club Transactions, Vol. XII., Parts 5 and 6, 1905.

"Irish Naturalist," Nos. 1—12, 1905. *Donor*, Mr. Charles Oldham.

Ireland. Report on the Sea and Inland Fisheries of, 1900. *Donor*, Mr. J. B. Feilding.

Lancashire and Cheshire Entomological Society. 29th Annual Report, 1905.

"Latham's History of Birds," Vols. I.—X. *Donor*, Mr. Chas. J. Wilson.

Linnean Society of London, Transactions, Part 2, 1901; Parts 3—7, 1900-01. *Donor*, Mr. J. B. Feilding.

Linnean Society of London, Journal, Nos. 179, 180, 181—184, 242—245, 1901-02. *Donor*, Mr. J. B. Feilding.

Linnean Society of London, Proceedings, 1900-02.

Liverpool, Proceedings of Literary and Philosophical Society, No. 58, 1905.

Liverpool Naturalists' Field Club, Proceedings of, 1904.

Manchester Literary and Philosophical Society, Memoirs and Proceedings, Vol. XLIX., 1904-5. *Donor*, Mr. Charles Oldham.

Manchester Microscopical Society, Annual Report and Transactions, 1886-1899, 1903 and 1904.

Manley (Thomas), "Ozotype," 1900. *Donor*, Mr. J. A. McMichael.

Mexico, Instituto Geologico de. Vol. I., No. 7, 1904; Vol. I, No. 8, 1905.

Mexico, Boletin del Instituto Geologico de, 1905.

Missouri Botanical Gardens, 17th Report, 1905.

"Museums' Journal," 1905.

"Naturalist," 1905.

Nicholson (H. Alleyne), "The Structure and Affinities of the Genus Monticulipora and its Sub-Genera," 1881. *Donor*, Mr. W. H. Meeson.

Nottingham Naturalists' Society, Annual Report and Transactions, 1904-05.

North Hants. Natural History Society and Field Club, Nos. 101-104. 1905.

Oldham, (Chas.), "On some habits of Bats, with special reference to the Lesser Horseshoe Bat." *Donor*, The Author.

Oldham (Chas.), "On the occurrence in Britain of the Pacific Eider." *Donor*, The Author.

Oldham (Chas.) and Cummings (S. G.), "Anglesea Bird Notes," *Donors*, The Authors.

Palæontographical Society, Vol. LIX., 1905.

Priest (Walter B.), "A Scheme for the promotion of Scientific Research." *Donor*, The Author.

Report on the condition of U.S.A. National Museum, 1904.

Russia, Transactions of Natural History Society of, 1905.

Sheppard, Thos. Quarterly Record of Additions, No. 14, 1905.

Smallwood, Mabel E. "Amphipod" *(Orchestia palustris)*, 1905.

Smith, Edgar A. "Description of a new species of Vitrea from Greece," 1905. *Donor*, Mr. Brockton Tomlin.

Smithsonian Institution. U.S.A, National Museum (Pamphlets), 1889-96, 1898-99, 1900-02, 1903-05. *Donor*, Mr. J. B. Feilding.

Smithsonian. Annual Reports, 1903-04.

Sopp, E. J. B. "The Birth and Infancy of Dytiscus punctulatus." *Donor*, The Author.

Staffordshire (North). Field Club, Annual Report, 1904-05.

University of Colorado Studies, Vol. II., No. 4, 1905.

Wall, E. J. "Carbon Printing," 1897. *Donor*, Mr. J. A. McMichael.

Wallis and Mill. "British Rainfall," 1901-03. *Donor*, Mr. J. Weaver.

Warren, W. J. "The Gum-Bichromate Process." *Donor*, Mr. J. A. McMichael.

"Watkin's Manual," 1902. *Donor*, Mr. J. A. McMichael.

West, W. and G. S. "British Desmidiaceæ," Vol. II., 1905, Ray Society.

"Zoologist," 1905.

Zoological Society of London, Proceedings, Parts 1 and 2, 1901.

Zoological Society of London, Transactions, Vol. XV., Parts 6 and 7. Vol. XVI., Parts 1 and 3, 1901. *Donor*, Mr. J. B. Feilding.

ALFRED NEWSTEAD,
*Curator and Librarian.*

APRIL 24TH, 1906.

# LIBRARY RULES.

1.—The Library will be open daily, except on Holidays, from 10 a.m. to 4 p.m.; and from 6 p.m. to 9-30 p.m. on the evenings when the Societies meet.

2.—As the Library is intended for purposes of study and reference, Members are expected to abstain from conversation which may be disturbing to other readers.

3.—Members are requested not to replace Books on the shelves, but to give them to the attendant for replacement.

4.—No Periodicals belonging to either Society are to be taken out of the Library.

5.—The Books belonging to the Archæological Society are intended as books of reference, and must not be taken away.

6.—Books belonging to the Society of Natural Science may, with certain exceptions, be taken out by Members of the Society, under the Rules of the Society. A receipt must be given to the Librarian for all Books so borrowed.

7.—Persons who are not Members of either Society, desiring to use the Library, must present a letter of introduction from a Member, endorsed by the Secretary, or President, of the particular Society whose Books they wish to consult; such order to be available for one week only.

# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1905,

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

## SHADE TEMPERATURE, AND DIFFERENCE FROM AVERAGE.

| Winter of 1904-5. | | Spring of 1905. | |
|---|---|---|---|
| December .. .. | 42·0°+2·4° | March .. .. | 42·4°—0·0° |
| January .. .. | 42·2°+3·6° | April .. .. | |
| February .. .. | 38·7°—1·2° | May .. .. | |
| Mean .. .. | 41·0 +1·5° | Mean .. .. | |

The Winter Months.—*December* and *January*, both very much above the average, especially January, which was one of the mildest on record, having only been thrice exceeded in the past 39 years; *February* 1·2 degrees *below* the mean—a sudden and extreme dip.

The Spring Months. -*March* was an average month as to temperature; but cold nights, keen easterly winds, and dull cheerless days, made it a very trying and backward spring month.

*April* and *May* not included because of absence from home on account of illness.

## NOTEWORTHY PHENOMENA OF 1905.

Greatest atmospheric pressure ..... 30.964 in., 28th January

Least „ „ ..... 28·649 in., 15th March

Hottest day in shade ..... 82·1 degrs., 25th June

Coldest night in shade ..... 23·0 degrs, 16th January

Greatest range of temperature in 24 hours .. 33·2 degrs., 17th May

Least „ „ „ .. 2·1 degrs., 22nd January

Hottest day in sun ..... 128·0 degrs., 12th July

Coldest night on ground ..... 19·3 degrs., 20th October

Greatest excess of open air temperature over shade temperature, 63·2 degrs., 1st August

Greatest difference between lowest temperature in shade and on ground, 15·0 degrs., 15th September.

Greatest rainfall on any one day ·850 inches, 30th June

Latest early Summer frost, 3·7 degrs, 9th June

Earliest Autumn frost 3·3 degrs., 21st September

Severe gales, 6th January and 15th March

Snow fell twice in January and once in April

Thunderstorms, twice in June and once in July and August

Greatest number of consecutive days on which rain fell: 11, 7th to 17th March.

Greatest number of consecutive days on which no rain fell: 14, 10th to 24th May.

Sunniest day of the year, 14·75 hours on 7th July, being 90 per cent. of the greatest possible amount.

Welsh hills at 9 a.m.—These were only visible on 137 days, a little more than one-third of the year; 74 days clearly, and 31 very clearly seen.

## EXPLANATIONS.

*Local Mean Time* is used for the regular observations.

*The Barometer* readings, taken at 9 a.m. and 9 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9-0 a.m., and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9·0 a.m. and placed to previous day.

*Ground Temperatures* read twice daily at 9 a.m. and 9 p.m. The lowest reading for the 24 hours, prior to 9 a.m., is entered to the previous day.

*Underground Temperatures* taken daily at 9 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew Point (as determined by Glaisher's Factors), by that corresponding to the temperature of the air (*i.e.*, the Dry-bulb reading).

*The Rain* is measured at 9 a.m., and the amount entered to the previous day. A fall of 0.006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9 a.m. and 9 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8·0 an overcast day.

The *Wind* direction is taken by means of a Compass Nephoscope, from the drift of the lower clouds.

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Sunshine Record.*—The photographic traces are fixed *before* being measured.

*Fog, &c.*—The fog, haze, &c., are made from the visibility of objects and lights at definite distances from Rutland Cottage.

As the tables give the meteorological elements for the year 1905 only, it is desirable to add a comparison of the winter and spring months of the present year in brief.

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | BRIGHT SUNSHINE. Hours ending Local Apparent Time of each Day of the Month. Forenoon. 6 | 7 | 8 | 9 | 10 | 11 | Noon | Afternoon. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Monthly. Total Hours. | Greatest Possible Percentage. | No. of days without. | Seasons. Hours and Percentage. | CLOUD (1—10). 9 a.m. | 9 p.m. | Daily Mean. | No. of days Overcast. | Clear. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. ... | | | | ·08 | 2·08 | 4·25 | 10·32 | 12·70 | 11·84 | 7·17 | | | | | | 48·44 | 19·7 | 11 | Winter 1155·06 20·9% | 8·0 | 7·1 | 7·6 | 17 | 2 |
| Feb. ... | | | | 3·23 | 7·50 | 10·66 | 11·89 | 12·23 | 10·22 | 8·65 | 6·24 | 1·25 | | | | 71·87 | 26·6 | 4 | | 7·1 | 6·4 | 6·8 | 11 | 3 |
| March.. | | | ·08 | 7·32 | 13·50 | 15·15 | 16·32 | 18·08 | 15·49 | 13·82 | 13·92 | 14·33 | 8·57 | 1·58 | | 138·16 | 38·0 | 1 | | 6·7 | 5·7 | 6·2 | 5 | 2 |
| April.. | | | 6·65 | 10·24 | 11·93 | 10·33 | 11·08 | 12·25 | 13·69 | 11·51 | 10·42 | 6·74 | 5·34 | ·67 | | 110·85 | 26·7 | 4 | Spring 453·67 35·9% | 8·5 | 7·5 | 8·0 | 17 | — |
| May ... | 2.33 | 8·41 | 15·58 | 16·16 | 18·91 | 17·33 | 17·05 | 17·32 | 17·40 | 18·50 | 15·84 | 15·92 | 12·83 | 10·41 | ·67 | 204·66 | 42·1 | 1 | | 6·7 | 5·8 | 6·3 | 6 | 2 |
| June ... | 7·41 | 12·59 | 14·24 | 15·83 | 15·16 | 17·26 | 17·68 | 17·08 | 19·00 | 16·82 | 15·74 | 14·66 | 11·49 | 10·59 | 5·25 | 210·80 | 42·3 | 4 | | 7 2 | 3·8 | 6·6 | 11 | 2 |
| July ... | **7·58** | **13·74** | **17·15** | **16·90** | **19·48** | **16·74** | **15·91** | **13 74** | **13·82** | **18·66** | **16·90** | **16·82** | **16·76** | **12·56** | **3·75** | **220·53** | **44·1** | 2 | Summer 590·00 41·4% | 6·2 | 5·1 | 5·6 | 1 | 4 |
| Aug. ... | | ·49 | 15·40 | 16·18 | 13·67 | 13·56 | 17·92 | 15·15 | 12·16 | 13·50 | 15·09 | 12·08 | 9·82 | 3·65 | | 158·67 | 35·3 | 1 | | 7·7 | 5·6 | 6·6 | 10 | 1 |
| Sept.... | | | 4·05 | 9·25 | 12·83 | 14·50 | 15·82 | 13·07 | 9·59 | 8·83 | 10·49 | 9·31 | 4·35 | | | 112·09 | 30·0 | 3 | | 7·5 | 5·3 | 6·4 | 8 | 1 |
| Oct. ... | | | ·67 | 8·08 | 11·68 | 11·49 | 12·65 | 13·08 | 9·42 | 8·34 | 8·24 | 2·50 | | | | 86·15 | 26·8 | 7 | Autumn 235·61 24·8% | 7·0 | 6·2 | 6·7 | 10 | 3 |
| Nov. ... | | | | | 3·66 | 6·42 | 7·07 | 8·00 | 4·90 | 3·99 | 2·25 | 1·00 | ·08 | | | 37·37 | 15·0 | 13 | | 8·3 | 6·8 | 7·5 | 15 | 1 |
| Dec. ... | | | | | ·17 | 2·88 | 9·41 | 11.82 | 7·67 | 2·50 | ·50 | | | | | 34·95 | 15·3 | 13 | | 7·4 | 6·7 | 7·0 | 13 | 2 |
| | 17·32 | 35·31 | 80·06 | 109·25 | 132·22 | 141·74 | 164.88 | 161·93 | 143·53 | 132·39 | 116·04 | 88·85 | 62·25 | 37·90 | 9.67 | 1434·54 | 32·5 | 64 | | 7·4 | 6·1 | 6·8 | 124 | 23 |

During Forenoon 681·78. During Afternoon 752·56.

# METEOROLOGICAL OBSERVATIONS

## RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N.; Long. 11m. 36s. W.

MONTHLY SUMMARY O

| | JAN. | FEB | MARCH. | APRI |
|---|---|---|---|---|
| PRESSURE (reduced to 32° F., and mean sea level)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 30·232in. | 30·146in. | 29·668in. | 29·88 |
| Highest reading | 30·964in. | 30·628in. | 30·328in. | 30·24 |
| ,, ,, Date of | 28 | 22 | 3 | 1 |
| Lowest ,, | 29·020in. | 28·953in. | 28·689in. | 29·09 |
| ,, ,, Date of | 16 | 27 | 15 | 30 |
| Range | 1·944in. | 1·675in. | 1·639in. | 1·14 |
| TEMPERATURE in shade (Stevenson's screen)— | | | | |
| Approximate mean | 40·3° | 42·5° | 45·1° | 45·8 |
| Arithmetical mean | 40·1° | 42·5° | 45·3° | 45·9 |
| 9 a.m. and 9 p.m. mean | 39·5° | 41·1° | 44·8° | 45·6 |
| Clirveatological mean | 39·8° | 42·5° | 45·1° | 45·4 |
| Mean maximum | 44·9° | 48·1° | 52·4° | 52·5 |
| Mean minimum | 35·3° | 36·9° | 38·3° | 39·4 |
| Extreme maximum | 53·5° | 57·0° | 59·0° | 60·4 |
| ,, ,, Date of | 6 | 18 | 22 | 12 |
| ,, minimum | 23·0° | 25·8° | 24·7° | 28·7 |
| ,, ,, Date of | 16 | 22 | 3 | 8 |
| ,, range | 30·5° | 31·2° | 34·3° | 31·7 |
| Mean daily range | 9·6° | 11·2° | 14·1° | 13·1 |
| Maximum daily range | 20·5° | 18·8° | 22·3° | 23·6 |
| ,, ,, Date of | 27 | 8 | 22 | 12 |
| Minimum ,, | 2·7° | 7·6° | 5·2° | 6·8 |
| ,, ,, Date of | 22 | 1 & 10 | 12 | 28 |
| Number of nights at or below 32° | 10 | 6 | 1 | 2 |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 58·5° | 73·7° | 85·9° | 86·2 |
| Extreme maximum | 82·6° | 94·8° | 101·9° | 103·1 |
| ,, ,, Date of | 29 | 16 | 30 | 15 & |
| Greatest excess over shade maximum | 31·7° | 40·4° | 48·8° | 51·8 |
| ,, ,, ,, ,, Date of | 29 | 26 | 3 | 24 |
| Average ,, ,, ,, | 13·6° | 25·6° | 33·5° | 33·7 |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 30·0° | 31·5° | 31·9° | 33·7 |
| Extreme minimum | 19·4° | 20·2° | 19·9° | 22·6 |
| ,, ,, Date of | 20 | 22 | 3 | 8 |
| Greatest difference from shade minimum | 11·7° | 9·9° | 9·9° | 13·5 |
| ,, ,, ,, ,, Date of | 7 | 18 | 28 | 3 |
| Mean ,, ,, ,, | 5·3° | 5·1° | 6·4° | 6·0 |
| Number of nights at or below 32° | 18 | 16 | 15 | 13 |
| TEMPERATURE underground— | | | | |
| Mean at 1 foot | 39·2° | 41·2° | 43·0° | 46·3 |
| Range ,, | 8·4° | 6·0° | 7·9° | 6·1 |
| Mean at 2 feet | 40·8° | 41·9° | 43·3° | 46·0 |
| Range ,, | 5·4° | 3·4° | 5·3° | 3·0 |
| Mean at 3 feet | 41·6° | 42·4° | 43·3° | 45·9 |
| Range ,, | 3·6° | 2·2° | 3·9° | 2·0 |
| Mean at 4 feet | 43·4° | 43·2° | 43·8° | 45·8 |
| Range ,, | 2·9° | 2·0° | 2·5° | 1·8 |
| Air temperature, 9 a.m. | 39·2° | 41·3° | 45·6° | 46·7 |
| Range of ,, ,, | 23·8° | 19·8° | 22·9° | 16·8 |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 1·060 | 1·095 | 2·400 | 1·9 |
| ,, ,, since 1st January | 1·060 | 2·155 | 4·555 | 6·4 |
| Maximum fall in 24 hours | ·240 | ·175 | ·315 | ·3 |
| ,, ,, Date of | 9 & 16 | 25 | 23 | 28 |
| Number of days 0·01 fell | 13 | 16 | 23 | 18 |
| ,, ,, since 1st January | 13 | 29 | 52 | 70 |
| Mean relative humidity, 9 a.m. | 84 | 84 | 81 | 82 |
| ,, ,, 9 p.m. | 85 | 84 | 80 | 82 |
| ,, ,, of both | 85 | 84 | 80 | 82 |
| Mean vapour pressure, 9 a.m. | ·201 | ·217 | ·244 | ·2 |
| ,, ,, 9 p.m. | ·208 | ·214 | ·239 | ·2 |
| ,, ,, of both | ·205 | ·215 | ·241 | ·2 |
| Mean dew point, 9 a.m. | 34·6° | 38·5° | 39·8° | 41·1 |
| ,, ,, 9 p.m. | 35·5° | 36·2° | 38·5° | 39·2 |
| ,, ,, of both | 35·1° | 37·3° | 39·2° | 40·0 |

# OF THE YEAR 1905.

## ROAD, CHESTER.

ATMOSPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| MAY. | JUNE. | JULY. | AUGUST. | SEPT. | OCTOBER. | NOV. | DEC. | YEARLY SUMMARY. |
|---|---|---|---|---|---|---|---|---|
| 0·150in. | 29·973in. | 30·007in. | 29·865in. | 29·989in. | 30·060in. | 29·670in. | 30·188in. | 29·982in. |
| 0·580in. | 30·400in. | 30·318in. | 30·329in. | 30·390in. | 30·559in. | 30·274in. | 30·922in | 30·964in. |
| 12 | 23 | 3 | 31 | 17 | 11 | 18 | 12 | 28 Jan. |
| 9·074in. | 29·645in | 29·513in. | 29·310in. | 29·435in. | 29·030in. | 28·816in. | 29·359in. | 28·649in. |
| 1 | 18 | 16 | 4 | 7 | 30 | 26 | 29 | 15 Mar. |
| 1·486in. | 0·755in. | 0·805in. | 1·019in. | 0·955in. | 1·529in. | 1·458in. | 1·563in. | 2·315in. |
| 52·0° | 59·7° | 62·8° | 58·0° | 54·1° | 46·0° | 41·6° | 42·2° | 49·2° |
| 52·6° | 59·7° | 63·5° | 58·5° | 55·1° | 46·2° | 41·6° | 42·1° | 49·4° |
| 52·0° | 59·6° | 62·7° | 60·6° | 54·0° | 45·9° | 40·7° | 47·0° | 49·3° |
| 52·5° | 60·6° | 63·4° | 58·6° | 55·4° | 46·2° | 41·6° | 42·0° | 49·4° |
| 62·1° | 70·2° | 72·2° | 66·9° | 62·4° | 53·0° | 46·7° | 56·4° | 57·3° |
| 43·1° | 50·5° | 54·7° | 50·2° | 47·8° | 39·3° | 36·6° | 37·7° | 42·5° |
| 72·6° | 82·1° | 81·8° | 72·8° | 73·6° | 59·0° | 56·8° | 55·0° | 82 1° |
| 8 & 28 | 25 | 8 & 14 | 14 | 4 | 9 | 22 | 7 | 25 June |
| 33·7° | 38·7° | 45·5° | 41·0° | 34·5° | 25·8° | 26·6° | 29·5° | 23 0° |
| 4 | 9 | 28 | 5 | 21 | 22 | 20 | 6 | 16 Jan. |
| 38·9° | 43·4° | 36·3° | 31·8° | 39·1° | 33·2° | 30·2° | 25·5° | 43·4° June |
| 19·0° | 19·7° | 17 5° | 16·7° | 14 6° | 13·7° | 10·1° | 18·7° | 14·8° |
| 33·2° | 32·8° | 32·1° | 28·6° | 27·5° | 24·8° | 22·8° | 19·5° | 33·2° |
| 17 | 11 | 8 | 5 | 21 | 22 | 22 | 6 | 17 May |
| 8·5° | 6·6° | 9 8° | 8·4° | 3·7° | 3·1° | 4·4° | 2·9° | 2·7° |
| 8 | 7 | 12 | 4 | 16 | 11 | 30 | 14 | 22 Jan. |
| — | — | — | — | — | 7 | 5 | 4 | 35 |
| 91·5° | 108·7° | 114·6° | 106·9° | 89·3° | 75·7° | 60 3° | 55·3° | 84·7° |
| 24·6° | 121·5° | 128·0° | 121·1° | 115·6° | 94·2° | 79·0° | 75·0° | 128 0° |
| 28 | 27 | 12 | 6 | 4 | 6 | 7 | 7 | 12 July |
| 54·1° | 50·9° | 55·5° | 63·2° | 45·7° | 40 7° | 25·5° | 21·2° | 63·2° |
| 8 | 2 | 12 | 1 | 7 | 6 | 7 | 2 | 1 Aug. |
| 39·4° | 38·5° | 44·4° | 40·0° | 26·9° | 22·7° | 13·6° | 8·9° | 28·4° |
| 35·9° | 42·9° | 49·8° | 45·0° | 40·4° | 32·3° | 30·3° | 32·3° | 36·3° |
| 27·0° | 28·3° | 41·0° | 37·2° | 28·7° | 19·3° | 19·4° | 25·4° | 19·3° |
| 9 | 9 | 4 | 24 | 21 & 27 | 20 | 17 | 16 | 20 Oct. |
| 13·2° | 11·9° | 9·3° | 11·3° | 15 0° | 14·9° | 10·6° | 11·0° | 15·0° |
| 21 | 29 | 13 | 4 | 15 | 14 | 23 | 8 | 15 Sept. |
| 6·2° | 7·6° | 4·9° | 5·2° | 7·4° | 7·0° | 6·3° | 5·4° | 6·1° |
| 9 | 3 | — | — | 4 | 18 | 20 | 21 | 137 |
| 51·8° | 58·5° | 63·5° | 59·5° | 55·4° | 48·3° | 44·2° | 42·4° | 49·4° |
| 9·8° | 7·6° | 7·4° | 2·9° | 7·6° | 14·2° | 6·7° | 3·7° | 7·4° |
| 50·8° | 56 6° | 61·5° | 59·2° | 56·4° | 50 3° | 44·9° | 43·5° | 49·6° |
| 6·5° | 5·8° | 3·6° | 2·5° | 6·0° | 7·9° | 4·9° | 2·9° | 4·8° |
| 49·6° | 54·6° | 58·9° | 58·3° | 56·3° | 51·5° | 46·4° | 44·5° | 49·4° |
| 5·3° | 4·9° | 2·8° | 2·0° | 3·4° | 5·7° | 3 9° | 2·0° | 3·7° |
| 48·8° | 53·4° | 57·7° | 57·9° | 56·2° | 52·4° | 47·8° | 45·2° | 49·6° |
| 4·1° | 4·6° | 3·2° | 1·6° | 2·5° | 5·1° | 3·5° | 1·4° | 2·9° |
| 54·0° | 61·7° | 65·0° | 64·1° | 55·7° | 46·5° | 40·7° | 41·5° | 50·2° |
| 20·4° | 22·2° | 17·5° | 11·6° | 19·3° | 22·0° | 24·3° | 18·7° | 19·9° |
| 1·235 | 2·650 | 1·795 | 3·390 | 1·470 | 1·725 | 2·860 | ·420 | 22·055 |
| 7·745 | 10·395 | 12·190 | 15·580 | 17·050 | 18·775 | 21·635 | 22·055 | — |
| ·310 | ·850 | ·650 | ·530 | ·470 | ·375 | ·420 | ·160 | ·850 |
| 2 | 30 | 26 | 2 | 9 | 15 | 4 | 29 | 30 June |
| 9 | 14 | 11 | 21 | 13 | 15 | 18 | 9 | — |
| 79 | 93 | 104 | 125 | 138 | 153 | 171 | 180 | 180 |
| 74 | 71 | 73 | 61 | 83 | 83 | 92 | 90 | 80 |
| 82 | 79 | 83 | 82 | 89 | 89 | 92 | 90 | 85 |
| 78 | 75 | 78 | 71 | 86 | 86 | 92 | 90 | 82 |
| ·310 | ·391 | ·447 | ·365 | ·368 | ·263 | ·235 | ·237 | ·295 |
| ·312 | ·373 | ·433 | ·384 | ·345 | ·268 | ·235 | ·237 | ·291 |
| ·311 | ·382 | ·440 | ·375 | ·356 | ·265 | ·235 | ·237 | ·293 |
| 46·1° | 52·2° | 55·9° | 50·4° | 50·1° | 41·5° | 38·7° | 38·5° | 43·9° |
| 44·3° | 50·9° | 54·9° | 51·7° | 48·8° | 42·0° | 38·7° | 38·8° | 43·3° |
| 45·2° | 51·5° | 55·4° | 51·0° | 49·5° | 41·7° | 38·7° | 38·6° | 43·6° |

## WIND.

| | Force. | | | | | Direction to 8 Points of the Compass. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 9 p.m. | Mean. | Maximum. | Date of. | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. |
| January | 2·0 | 2·0 | 2·0 | 9 | 6 | NW | 1 | — | — | 8 | 6 | 3 | 11 | 15 | 18 |
| February | 1·9 | 1·8 | 1·9 | 6 | 19 | W | 2 | 3 | — | 1 | 2 | 6 | 15 | 10 | 17 |
| March | 2·3 | 1·6 | 1·9 | 9 | 15 | W | 1 | 1 | — | 6 | 8 | 12 | 18 | 5 | 11 |
| April | 2·2 | 1·4 | 1·8 | 8 | 5 | SE | 2 | 3 | 5 | 10 | 4 | 8 | 7 | 7 | 14 |
| May | 1·9 | 0·4 | 1·2 | 5 | 1 & 3 | W | 2 | 4 | 1 | 1 | 2 | 10 | 7 | 6 | 29 |
| June | 1·9 | 1·0 | 1·4 | 5 | 20 | E | 3 | 6 | 10 | 4 | 4 | 9 | 2 | 2 | 20 |
| July | 1·4 | 0·7 | 1·0 | 6 | 6 | SW | — | — | — | 10 | 1 | 21 | 5 | 2 | 23 |
| August | 2·3 | 0·9 | 1·6 | 8 | 19 | SW | 3 | 2 | — | 3 | 4 | 15 | 8 | 7 | 20 |
| September | 2·1 | 0·9 | 1·5 | 7 | 2 | W | 2 | 4 | 3 | 1 | — | 11 | 10 | 6 | 23 |
| October | 2·0 | 1·5 | 1·7 | 8 | 4 | NW | 6 | 1 | — | 2 | 1 | 6 | 5 | 17 | 24 |
| November | 1·2 | 0·8 | 1·0 | 5 | 22 & 27 | SW | 2 | 1 | 1 | 3 | 4 | 9 | 6 | 2 | 32 |
| December | 1·2 | 1·2 | 1·2 | 5 | 31 | S&W | — | — | 2 | 5 | 11 | 9 | 10 | 7 | 18 |
| Totals | 1·9 | 1·2 | 1·5 | 9 | Jan. 6 Mar. 15 | SW | 24 | 25 | 22 | 54 | 47 | 119 | 104 | 86 | 249 |
| Percentages | | | | | | | 3·3 | 3·4 | 3·0 | 7·4 | 6·5 | 16·3 | 11·3 | 11·8 | 34·0 |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | At 9 A.M. or 9 P.M. or both. | | | | | At any Hour. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Welsh Hills 9 a.m. | | | | | | | | | | | |
| | Dew. | Hoar Frost. | Invisible | Visible. Clearly | Visible. Very clearly | Thunder-storm. | Lightning only. | Thunder only. | Corona. | Gales. | Aurora. | Snow. | Hail. | Fog. |
| January | 2 | 4 | 17 | 4 | 3 | — | — | — | — | 1 | — | 2 | 1 | 1 |
| February | 2 | 5 | 12 | 9 | 2 | — | — | — | 1 | 2 | — | — | 1 | — |
| March | 10 | 1 | 12 | 10 | 5 | — | — | — | — | 2 | — | — | 1 | 1 |
| April | 3 | — | 20 | 6 | 2 | — | — | — | — | 1 | — | 1 | — | — |
| May | 8 | — | 17 | 7 | 4 | — | — | — | — | — | — | — | — | — |
| June | 2 | — | 25 | 2 | 2 | 2 | 3 | — | — | — | — | — | — | — |
| July | 11 | — | 15 | 12 | 1 | 1 | 1 | — | — | — | — | — | — | — |
| August | 9 | — | 19 | 8 | 4 | 1 | 1 | — | — | 2 | — | — | — | — |
| September | 14 | — | 19 | 3 | 6 | — | — | — | — | 1 | — | — | — | 1 |
| October | 6 | 5 | 24 | 3 | 1 | — | — | — | 1 | 2 | — | — | — | — |
| November | 6 | 4 | 26 | 3 | — | — | — | — | 1 | — | 1 | — | — | 5 |
| December | 8 | 2 | 22 | 7 | 1 | — | — | — | — | — | — | — | — | 1 |
| Totals | 81 | 21 | 228 | 74 | 31 | 4 | 5 | — | 3 | 11 | 1 | 3 | 3 | 9 |

# KINGSLEY MEMORIAL PRIZES

ARE OFFERED UNDER THE FOLLOWING CONDITIONS:—

## CLASS I.

**To any Resident in the Society's District.**—A Prize not exceeding Ten Pounds for the best Collection of Objects, or Essays, or Notes of Observations, or Photographs illustrating the Natural Science of the Society's District.

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the Competitors.

Collections, or Essays, or Notes, must be sent to the General Secretaries on or before September 1st, and the awards will be made at the Conversazione next succeeding.

The Committee have the option of retaining successful Collections, &c., for the Society.

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## CLASS II.

**In order to encourage the study of Natural History among younger Students, not exceeding 17 years of age, and residing in the Society's District, *i.e.*, Cheshire and North Wales, the following Prizes and Certificates are offered, viz.:—**

**The FIRST PRIZE in each Class will be HALF-A-GUINEA, together with the Society's Certificate.**

**Collections, Essays, or Photographs not gaining a Prize, may be awarded Certificates if found to be of sufficient merit.**

1.—For the best description, accompanied by drawings and dried specimens, of the entire plants and dissected flowers of the Buttercup and the Daisy.

2.—For the best account of the Plants growing upon the City Walls (dried specimens not required).

3.—A Collection of six preparations showing Life-Histories of six Injurious Insects of field and garden.

4.—A Collection of Seeds and Fruits illustrating Dispersal in nature.

5.—A Collection of Weeds from Arable Land, named and classified according to the kind of soil—heavy land weeds, light land weeds, peaty land weeds, &c. (the roots should be included).

6.—Nature-Study Calendar of plants first observed in bloom; Insects first observed; Migratory Birds and Young Birds first observed.

7.—For the best description of a Pond, including its Animals and Plants.

8.—For the best description, with drawings and dried specimens, of the plant and an opened-out flower, of either the cultivated Oat or the False Oat Grass.

9.—For the best set of four Photographs of any Natural History Subjects, quarter-plate size.

10.—For the best account of the Life-History of the Starling.

CONDITIONS.—All the work to be done entirely by the Competitors themselves, who must be under 17 years of age. The Essays and Collections should be sent under a *nom de plume*, accompanied by a sealed letter containing the full name and exact age of the Competitor, to the Hon. Secretaries on or before September 1st, 1906.

The awards will be made at the Society's Conversazione next succeeding the adjudication.

The Committee do not bind themselves to give the full prize in case of insufficient merit.

Any further information required can be had on application to the Hon. Secretaries.

# KINGSLEY MEMORIAL MEDAL

ESTABLISHED 1877,

*"For having contributed materially to the promotion and advancement of some branch or department of Natural Science."—Vide* Trust Deed.

1877—MRS. CHAS. KINGSLEY (In Memoriam).
1878—JOHN PRICE, M.A.
1879—SIR PHILIP DE MALPAS GREY-EGERTON BART., F.R.S.
1880—PROF. T. MCKENNY HUGHES, F.R.S.
1881—D. MACKINTOSH, F.G.S.
1882—ISAAC BYERLEY, M.R.C.S., F.L.S.
1883—GEORGE W. SHRUBSOLE, F.G.S.
1884—ALFRED OSTEN WALKER, F.L.S.
1885—JOHN DAVIES SIDDALL.
1886—HENRY STOLTERFOTH, M.A., M.D.
1887—WILLIAM SHONE, F.G.S.
1888—THOMAS SHEPHEARD, F.R.M.S.
1889—THOMAS RUDDY.
1890—REV. CHARLES WOLLEY-DOD, M.A.
1891—ROBERT NEWSTEAD, F.E.S.
1892—OSMUND W. JEFFS.
1893—EDMUND J. BAILLIE, F.L.S.
1894—W. MURRAY DOBIE, M.D., F.R.A.S.
1896—REV. ARTHUR H. FISH, B.A., B.SC.
1897—WILLIAM HENRY DOBIE, M.B.
1899—W. F. LOWE, A.R.S.M., F.I.C., F.C.S.
1900—JOSEPH ARKLE.
1901—THOMAS ALFRED COWARD.
1902—CHARLES OLDHAM.
1903—GEORGE P. MILN.
1904—GEORGE O. DAY, F.E.S.
1905—C. THEODORE GREEN, M.R.C.S., L.R.C.P., F.L.S., &C.

# KINGSLEY MEMORIAL PRIZES

(OF £5 AND UPWARDS)

ESTABLISHED 1877,

*"For the reward, encouragement, and the advancement of the pursuit and study of Natural Science."—Vide* Trust Deed.

| | | | |
|---|---|---|---|
| 1878 | HELEN SMITH ..... £5<br>EDWIN W. OKELL ..... 5 | } | *Herbarium of Flowering Plants.* |
| 1879 | GEORGE SHRUBSOLE ..... 5 | | *Carboniferous Fossils.* |
| 1881 | E. HOPKINS ..... 5 | | *Cryptogamous Plants.* |
| 1882 | GEORGE SHRUBSOLE ..... 10 | | *Corals of the Mountain Limestone.* |
| 1886 | ROBERT NEWSTEAD ..... 10 | | *Hymenoptera.* |
| 1887 | JOHN LYON DENSON ... 5 | | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888 | LILIAN E. TOMLIN ..... 5 | | *Coleoptera.* |
| 1889 | EDITH C. TOMLIN..... 5<br>W. E. SHARP ..... 5 | } | *Diptera and Hymenoptera (Terebrantia).*<br>*Coleoptera.* |
| 1890 | ALFRED J. NIXON ..... 10 | | *Land and Fresh-Water Shells.* |
| 1892 | W. E. SHARP ..... 10 | | *Coleoptera.* |
| 1896 | ALFRED NEWSTEAD...£5 5s. | | *Hydradephaga (Water Beetles) and Life Histories of Insects.* |
| 1897 | ALFRED NEWSTEAD...£5 5s. | | *Life Histories of Insects.* |
| 1900 | MISS M. BOWERS .....£5 | | *Collection of Botanical Specimens.* |
| 1901 | A. E. GOODMAN .....£5 5s. | | *Collection of Photo-Micrographs, with Notes and Observations.* |
| 1902 | C. THEODORE GREEN...£10 | | *Collection of 148 Microscopical Preparations and 170 Herbarium Specimens of Micro-Fungi, together with a descriptive Catalogue and Essay on same.* |

Amounts less than £5 are also awarded annually.

## Last year Junior Prizes and Certificates were awarded as follows:—

*(a) For the best account of the Life-History of the Cuckoo:—*

JAMES DOUGLAS MILN, Arnold House School, Chester ..Prize of One Guinea
LILY MAUD SUTTON, Castle Northwich .....Certificate of Merit

*(b) For the best descriptions of the following Trees:—The Oak; Horse-Chestnut; Beech; Lime; Birch; and Ash; together with dried specimens of Leaves, Flowers, and Fruit of each:—*

THOMAS A. WEAVER, College School, Chester .....Prize of One Guinea and an extra Grant of 10/6
ARTHUR WEAVER, Boughton British School, Chester.....Prize of Half-a-Guinea
EMILY BIRD, Bromborough Pool School .....Certificate of Merit

*(c) For the best Essay on Coal:—*

LOUIS FENN, Wallasey Grammar School, Liscard .....Prize of One Guinea
KENNETH S. DICKINSON, Secondary Day School, Chester..Prize of Half-a-Guinea
GRACE WOOLLEY, Alpraham, Tarporley .....Certificate of Merit
JAMES R. STOCKTON, Aldersey Grammar School, Bunbury.. ,, ,,
HENRY GOLL, Port Sunlight Senior School..... ,, ,,

*(d) For the four best Photographs of Natural Objects; such as: Birds, Trees, Flowers, Rocks, Clouds, or Scenery of Cheshire or North Wales:—*

F. B. SIMPSON, Secondary Day School, Chester .....Prize of One Guinea

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## "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Accounts for the Year ended 30th April, 1906. **Cr.**

| 1905-1906. | £ | s. | d. |
|---|---|---|---|
| To Balance from last Account | 7 | 15 | 6 |
| ,, Dividends on Great Western Railway Company Consolidated Ordinary Stock | 15 | 6 | 4 |
| | £23 | 1 | 10 |
| To Balance in Bank ..... | £12 | 12 | 1 |

| 1905-1906. | £ | s. | d. |
|---|---|---|---|
| By Prizes awarded as follows: | | | |
| Mr. J. A. Stendall, Senior Prize ..... | 2 | 2 | 0 |
| Amounts paid for Junior Prizes ..... | 5 | 15 | 6 |
| ,, Printing Account ..... | 2 | 10 | 0 |
| ,, Engraving Medal for Dr. Green, F.L.S..... | 0 | 2 | 3 |
| Balance ..... | 12 | 12 | 1 |
| | £23 | 1 | 10 |

*29th April*, 1906—Examined and found correct,

GEORGE P. MILN, HON. TREASURER.

J. ARKLE, AUDITOR.

# PAST PRESIDENTS.

1871 to 1875—Rev. Charles Kingsley, Canon of Chester
*(Founder of the Society).*
1875 „ 1891—Prof. T. McKenny Hughes, F.R.S.
1891-2 Alfred O. Walker, Esq., J.P., F.L.S.
1892-3 His Grace The Duke of Westminster, K.G.
1893 to 1895—W. Murray Dobie, Esq., M.D., J.P., F.R.A.S.
1895 „ 1897—Henry Stolterfoth, Esq., M.A., M.D., J P.
1897-8 Thomas Shepheard, Esq., F.R.M.S.
1898 to 1902—John D. Siddall, Esq.
1902 „ 1906—Rev. Arthur H. Fish, B.A. B Sc.

# SOCIETIES ASSOCIATED

## WITH WHICH THE SOCIETY EXCHANGES PUBLICATIONS.

Academia Nacional de Ciencias de la Republica Argentina, Cordoba
Barrow Naturalists' Field Club
Brighton and Sussex Natural History Society.
Bristol Naturalists' Society.
British Association (Corresponding Society's Committee).
British Museum (Natural History), Cromwell Road, London, S.W.
Burnley Literary and Scientific Club.
Cardiff Naturalists' Society.
Corporation Museum, Colchester
Dudley and Midland Geological and Scientific Society and Field Club.
Essex Field Club.
Glasgow Natural History Society.
Hertfordshire Natural History Society and Field Club.
Huddersfield Naturalists' Society.
La Société d'Histoire Naturelle de St. Wladimir á Kiew, Russie.
Leeds Naturalists' Club.
Liverpool Geological Society.
Liverpool Geological Association.
Liverpool Literary and Philosophical Society.
Liverpool Microscopical Society.
Liverpool Naturalists' Field Club.
Liverpool Science Students' Association.
Manchester Field Naturalists' Society.
Manchester Geological Society.
Manchester Microscopical Society.
Menai Society of Natural Science.
Mexico, Geological Institute of.
Northampton Natural History Society.
North Staffordshire Naturalists' Field Club and Archæological Society.
Nottingham Naturalists' Society.
Patent Office Library, 25, Southampton Buildings, Chancery Lane, London, W.C.
"Public Works," St Bride's House, 24, Bride Lane, Fleet Street, London, E.C.
Scotland, West of, Marine Biological Association.
Smithsonian Institution, Washington City, D.C., U.S A.
Southport Society of Natural Science.
The Lloyd Library and Museum, Cincinnati, Ohio, U.S.A.
The Missouri Botanical Garden, St. Louis, U.S.A.
United States Geological Survey.
University of Montana, Biological Station, Missoula, Montana, U.S A.
University of Colorado, Boulder, Colorado, U.S.A.
University of Washington, Seattle, Wn., U.S.A.
Vatican Observatory, Rome.
Vienna Natural History Museum.
Yorkshire Naturalists' Union, Leeds.

## HONORARY MEMBERS.

*Those marked (*) have read or contributed Papers at the Society's Meetings.*

*Avebury, The Right Hon. Lord, F.R.S. ...*Down, Farnborough, Kent*
*Ball, Sir Robert S., F.R.S. ...*Observatory, Cambridge*
Barrett, Chas. G., Esq., F.E.S. ...*Tremont, 198a, Peckham Rye, London, S.E.*
Candolle, Mons. Casimir De ...*Geneva*
Cannizaro, Prof. ...*Rome*
*Carruthers, W., Esq., F.R.S. ...*The British Museum, South Kensington, London, S.W.*
Credner, Dr. Hermann ...*Leipzic*
*Dawkins, Prof. W. Boyd, F.R.S. ...*Woodhurst, Wilmslow Road, Fallowfield, Manchester*
*Hicks, H., Esq., F.R.S. ...*Hendon Grove, Hendon, London, N.W.*
Hooker, Sir J. D., K.C.S.I., F.R.S. ...*The Camp, Sunningdale, Ascot*
*Hughes, Prof. T. McKenny, F.R.S. ...*Trinity College, Cambridge*
*Hull, Prof., F.R.S. ...
*Judd, Prof. J. W., F.R.S. ...*Royal College of Science, South Kensington, London, S.W.*
Kelvin, The Right Hon. Lord, F.R.S. ...*28, Chester Square, London, S.W.*
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*Newstead, Robert, Esq., A.L.S., F.E.S. ...*Witcombe Villa, Handbridge, Chester*
*Poulton, Prof. E. B., F.R.S. ...*Wykeham House, Oxford*
*Rae, E., Esq., F.S.A. ...*Courthill, Birkenhead*
Renard, The Abbé ...*Curator of the Royal Museum of Natural History, Brussels*
Röntgen, Prof. W. K. ...*Würzburg*
Roscoe, Sir Henry E., F.R.S. ...*10, Bramham Garden, London, S.W.*
*Rudler, F. W. Esq., F.G.S. ...*Museum of Practical Geology, Jermyn Street, London, S.W.*
Sanderson, Dr. Burden, F.R.S. ...*64, Banbury Road, Oxford*
Saunders, Howard, Esq., F.L.S. ...*7, Radnor Place, Hyde Park, London, W.*
*Sorby, Dr., F.R.S. ...*Bromfield, Sheffield*
*Strahan, Aubrey, Esq., F.R.S. ...*28, Jermyn Street, London, S.W.*
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Harrison, Mr. Walter ...*New Pale, Manley, Warrington*
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# NOTICE.

☞ **THE ANNUAL SUBSCRIPTIONS are due on the 1st of May in each year. Members who have not paid for the present year are respectfully requested to forward the amount (Five Shillings) to the Hon. Treasurer, Mr. JOHN SIMON, Chemist, 4, Eastgate Row.**

*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their names are retained on the Society's Books, and their Subscriptions considered due, until notice has been given to the contrary, according to Rule* 9.

# LIST OF MEMBERS.

*Those marked* (*) *have read or contributed Papers at the Society's Meetings.*

Acton, Mrs. .....3 Grove road, Wrexham
Adair, Major-General .....7 Stanley place
Adams, Mr. Beresford .....Shirley House, Liverpool road
Adams, Mrs. ..... ,, ,,
Adams, Mr. H. Dean ..... ,, ,,
Adams, Mr. Geo. F. .....Ashbourne, Victoria road
Adams, Miss Sissy ..... ,, ,,
Adams, Miss Lena ..... ,, ,,
Ainsworth, Miss F. .....4 Nicholas street
Allen, Mr. F. J., M.A., B.Sc.....14 Eaton road
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Anderson, Mr. Percy .....26 Hamilton street, Hoole
Andrew, Mr. John R. .....18 Bold square
Andrew, Miss R. ..... ,, ,,
Andrews, Miss Edith .....2 West View, Dee banks
Andrews, Miss Margaret ..... ,, ,,
*Ankers, Mr. W. H. .....6 City road
*Arkle, Mr. J. .....Diocesan School, George street
Armstrong, Mr. Andrew W. ....Spring Villa, 22 Liverpool road
Armstrong, Mrs. ..... ,, ,,
Armstrong, Mrs. Frances .....62 Gladstone Road
Atkin, Mr. Chas. .....Confectioner, Foregate street
Atkin, Mrs. ..... ,, ,,
Austin, Miss Ida .....27 City road
Ayrton, Mr. A. .....2 Chichester street
Ayrton, Mrs. ..... ,, ,,
Ayrton, Mr. Wm. .....Beccles, Suffolk

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*Ballard, Mr. E. G., A.R.S.M. ..Greenfield Cottage, Hoole road
Ballard, Mrs. ..... ,, ,,
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Barber, Ven. Archdeacon, M.A., F.S.A. ..... } St. Bridget's Rectory
Barber, Miss May .....4 Kilmorey road
Barbour, Mr. Geo., D.L., J.P. ..Bolesworth Castle, Tattenhall
Barbour, Mrs. ..... ,, ,, ,,
Barker, Mr. C. E. .....The Town Hall
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Barnes, Mr. J. W. .....Grosvenor Park House, Union street
Barnes, Mrs. ..... ,, ,, ,,
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Bate, Mr. J. C. .....Summerfield, Kilmorey Park
Bate, Mrs. ..... ,, ,,
Bates, Mr. W. N. .....Bull and Stirrup Hotel
Bates, Mrs. ..... ,, ,, ,,
Baxter, Mr. Geo. .....Park view, Panton road, Hoole
Beauchamp, Rt. Hon. The Earl, K.C.M.G. ..... } Madresfield Court, Malvern
Beauchamp, Rt. Hon. The Countess ,, ,, ,,
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Beswick Miss. .....Sunny bank, Queen's park
*Beveridge, Rev. P. J., M.A., B.Sc. (Hons.), Oxton, Birkenhead
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Birch, Miss .....18 Upper Northgate street
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Bithell, Mr. W. .....Messrs. Beckett & Co., Eastgate row
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Bleckly, Mrs. ..... ,, ,,
*Blogg, Rev. H. B., M.A. .....Frodsham Vicarage, Cheshire
Blomfield, Admiral Sir R. M. { c/o Messrs. Woodhead & Co., 44 Charing Cross, London
Blower, Mr. T. B. .....6 The Groves
Boden, Mr. Robt. W. .....Saighton lodge, Chester
Bolland, Mrs. ..... 46 Hough green
Bolland, Mr. Frank ..... ,, ,,
*Bonnalie, Mr. Fredk. J., L.D.S., R.C.S.,..4 Abbey square
Bonnalie, Mrs. ..... ,, ,,
Booley, Miss .....11 Lorne street
Bostock, Mrs. J. .....Kingsley Hey, Newton lane
Bourne, Mr. Harold ..... { c/o Miss Golder, 6 St. John's road, Queen's park
Bowers, Mr. J. H. .....Tyddyn Ucha, Pen-y-bryn, Ruabon
Bowles, Mrs. T. S. .....The Hollies, Liverpool road
Bowles, Miss Agnes Millicent .. ,, ,,
Box, Miss Jessie .....4 Kilmorey road
Boyer, Miss Edith .....2 Paradise row
Bradbury, Mr. R. P. .....Walmore, Dee banks
Brassey, Miss. .....Rose Hill, Bowdon, Cheshire

Brassey, Mr. Herbert .....The Limes, Curzon park
Brassey, Mrs. ..... ,, ,,
Brewer, Miss Anne .....15 Paradise row
Bridge, Dr. J. C., M.A., F.S.A...Christ Church Vicarage
Bridge, Mrs. ..... ,, ,,
Bridge, Miss ..... ,, ,,
Bright, Mr. W. H. .....38 Eastgate row
*Broadbent, Mrs. .....Bache Cottage
*Brown, Mr. F. F., M.A., J.P. ..Eastgate row
Brown, Miss .....61 Bouverie street
Brown, Miss Daisy ..... ,, ,,
Brown, Mr. W. E. .....33 Parkgate road
Brown, Mrs. ..... ,, ,,
Brown, Mr. W. Ernest ..... ,, ,,
Brown, Mrs. H. T. .....Westminster avenue, Hough green
Brown, Mr. E. C. .....7 Lorne St. (W.)
Brown, Mr. Fred .....2 Eastgate row
Brown, Miss L. G. .....5 Ash grove, Wrexham road
Buckland, Miss .....31 Nicholas street
Bull, Mr. H. F. .....4 Sunny bank, Queen's park
Bull, Mrs. ..... ,, ,,
Bullin, Mrs. .....20 Nicholas street
Bullin, Miss E. ..... ,, ,,
Burges, Mr. R. O. .....Whitford, 11 Panton road, Hoole
Burges, Miss J. V. ..... ,, ,, ,,
Burges, Miss L. O. ..... ,, ,, ,,
Burness, Mr. Wm. .....Parr's Bank, Ltd., Chester
Butcher, Mr. Jas. .....19 Seller street

Caldecott, Miss C. G..... { c/o Miss Mawe, Royal Sanatorium, Weston-super-Mare
Cameron, Mrs. .....57 Tarvin Road
Campbell, Mrs. Pitcairn .....Christleton Hall
Campbell, Mr. A. D. Pitcairn .. ,, ,,
Carr, The Hon. Mrs. .....14 Hough green
Carter, Mr. T. .....171 Boughton
Catherall, Mr. Samuel .....1 Linenhall street
Catherall, Miss E. .....Hawthorn Dene, Hoole road (South)
Catherall, Miss F. ..... ,, ,, ,,
Challinor, Mr. R. .....34 Eaton road
Chalton, Mr. T. W. .....Wynstay, Hoole
Chalton, Mrs. ..... ,, ,,
Chambers, Mr. Frank .....13 Curzon park
Chambers, Mrs. ..... ,, ,,
Chapman, Mr. F. W. .....46 Tarvin road
Chapman, Mr. M. D. .....59 Tarvin road
*Chester, The Right Rev. The Lord Bishop of ..... } The Palace, Dee side
Chidley, Mr. T. .....14 St. Werburgh street
Churton, Mrs. G. .....96 Watergate flags
Clark, Mr. Sidney.....Upton Villa
Clark, Miss Sybil .....Stanley house
Clark, Miss Eva .....19 Grosvenor street
Clarke, Mr. John .....Pasadena, Liverpool road
Clarke, Mr. W. J. .....
Clarke, Mr. Ernest (B. Eng.) } Water Engineers' Department, Municipal Offices, Liverpool
Clare, Mr. Horatio .....Grosvenor Schools
*Clay, Miss Beatrice E., B.A. ....The Queen's School
Clayton-East, Mr. G. F. L. ....Pinetum Lodge, Liverpool road
Clayton, Miss Bianca .....17 Vicarage road, Hoole

Clemence, Mr. Thos. .....56 Hough green
Clough, Mr. G. F. .....78 Hough green
Cochrane, Mr. J. G.....9 Grange road, Brook lane
Cockrill, Mr. C. P. .....Briercliffe, Hough green
Cockrill, Mrs.....,, ,,
Coe, Mr. D. .....Howard Lodge, Hamilton street
Coe, Mr. Henry J. .....18 Queen's avenue
*Cole, Mr. R. S., M.A., A.M.I.C.E...Arnold House
Collinge, Mr. James.....Kinnerton Lodge, Chester
Coltart, Mr. C. B.....23 Hough green
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Comber, Miss Maria E. ..... ,, ,,
Comber, Miss Margaret ..... ,, ,,
Connah, Mr. Jas. ..... 12 Cecilia road, Heath drive, Hampstead, London, N.W.
Conway, Mr. Walter .....8 and 10 Old Bank buildings
Conyers, Mr. W. R.....47 Parkgate road
Cook, Mr. G. Mark .....110 Foregate street
Cook, Mr. R.....7 The Groves
Cook, Miss Alice M. ..... ,, ,,
Cook, Mr. George Hatt .....Oak Cottage, Upton
Cook, Mr. Kenneth, C.A. .....Godstall Chambers
Cooke, Mr. J. H. .....6 Queen street
Coppack, Mr. Chas. .....Gladwyn, Liverpool road
Coppack, Miss ..... ,, ,,
Coppack, Miss Nellie ..... ,, ,,
Cox, Miss Amy C., B.Sc. .....11 Cheshire view, Handbridge
Crane, Mr. H. E. .....Savings Bank House, Grosvenor street
Crawford, Mr. Geo. Henry .....13 Lower Bridge street
Cresswell, Mr. John, A.I.C.E. ..8 Ash grove, Wrexham road
Cresswell, Mrs. ..... ,, ,,
Cresswell, Miss ..... ,, ,,
Croston, Mr. J., Junr. .....Holmesdale, Brook lane
Croston, Mrs..... ,, ,,
Croston, Miss.....Dalmeny, Shavington avenue, Hoole
Cullimore, Mrs.....Christleton, Chester
Cumberbirch, Miss .....7 Paradise Row
Cumming, Mr. Jas., L. D. S., F. P. S. Glas. ..... 39 City road
*Cummings, Mr. Sidney G. .....6 King's buildings
Curtis, Mr. George M.....1 Stone place, Hoole

*Darby, The Very Rev. J. L., D.D.The Deanery
Darby, Mrs. ..... ,,
Darby, Miss ..... ,,
Darby, Mr. Alfred .....Laurel Grove, near Wrexham
Davies, Miss Henrietta.....69 Boughton
Davies, Mr. E. Henry .....19 Francis street
Davies, Mr. Joseph ..... ,, ,,
Davies, Mr. John .....Parr's Bank, Limited, Chester
Davies, Mr. W. L. .....Beechwood House, Canal street
Davies, Mrs. ..... ,, ,, ,,
Davies, Rev. J. T., M.A. .....6 Abbey green
Davies, Mr. W. L. Cameron ....Victoria pathway, Queen's park
Davies, Mr. Arthur .....23 Lord street, Boughton
Davies, Mrs. ..... ,, ,,
Davies, Miss Hazlem .....1 King's buildings
Davies, Mr. E. Harold.....Burland, Westminster park
Davies, Mrs. ..... ,,
Davies, Mr. L. E. .....North & South Wales Bank
Davies, Mr. Horace .....14 Newgate street

Davison, Mr. George .....4 Chichester street
Day, Mr. John .....Bryntirion, Chichester street
Day, Mrs. ..... " " "
Day, Miss ..... " " "
Delany, Mr. John.....7 Lorne street (South)
Delany, Mrs. ..... " "
Denson, Mr. W. .....21 Upper Northgate street
Denson, Mrs..... " "
Denson, Miss Adelaide ..... " "
Denson, Mr. J. Lyon .....4 Upper Northgate street
Denson, Mrs. ..... " "
Denson, Mr. W. H. .....Westminster park, Hough green
Denson, Mrs. ..... " " "
Denson, Mr F. R. .....Abbot's Mount, 33 Liverpool road
Denson, Mrs. ..... " " "
Dew, Mr. W. R..... c/o Messrs. Douglas & Minshull, 6 Abbey square
Dickinson, Mr. D.....1 Upton view, Hoole
Dickinson, Mrs..... " "
Dickson, Mr. Geo. A., J.P.....Springfield, Flookersbrook
Dickson, Mr. J. H. .....St Ives, Queen's park
Dickson, Mrs. ..... " "
Digby, Miss .....2 Grey Friars
Dixon, Mr. Phillip .....Modyn house, Liverpool road
*Dobie, Dr. W. M., F.R.A.S., J.P. 4 Hunter street
*Dobie, Dr. W. H., M.B.....2 Hunter street
Dobie, Mrs. ..... " "
*Dobie, Dr. Herbert .....Northdene, Upper Northgate street
Dobie, Mrs. ..... " " "
Dobie, Mr. Douglas .....Upton House, Chester
Dobie, Mrs. ..... " "
Dod, Miss Wolley.....Edge Hall, Malpas
Dodd, Mr. W. .....Mayfield Cottage, 7 Vicarage road, Hoole
Dodd, Mr. Henry .....Lime Grove, Panton road, Hoole
Dodd. Mr. John.....73 Bouverie street
Dodds, Mr. Arthur W., L.D.S.E...Thornleigh, 3 Westminster park
Donald, Mrs. .....The Cross
Douglas, Mr. C. P. .....St. Martin's House
Douglas, Mrs. ..... " "
Dowdall, Colonel A. P. .....25 Curzon park
Dowdall, Miss A. ..... " "
*Drabble, Mr. Eric, D.Sc., F.L.S...Hartley Botanical Laboratory, University of Liverpool
Drinkwater, Dr. H. .....Wrexham
Ducker, Mr. P. J. .....George street
Duckworth, Mr. Henry, F.L.S., F.G.S...7 Grey friars
*Duff, Dr. J. .....5 Abbey street
Dufton, Mr. Arthur, M.A., B.Sc..5 Eversley park, Liverpool road
Dufton, Mrs. ..... " "
Dunning, Mr. J. H. .....Sandon, Hoole road
Dunning, Mrs. ..... " "
Dutton, Mr. George F. .....Aldersey Grammar School, Bunbury, Tarporley
Dutton, Mrs. G. W.....Claremont, Vicar's Cross
Dutton, Mr. H. B. .....Freshfield, 27 Curzon park
Dutton, Mrs. ..... " "
Dutton, Miss M. .....11 Grosvenor road
Dutton, Mr. A. E. .....51 Frodsham street
Dutton, Mr. John .....Littleton Hall Gardens
Dye, Mr. Alfred B. .....Fairhazel, 30 Bouverie street
Dye, Miss Ethel.. ..... " "

Ealand, Mrs. .....Hovendene, Dee Hills Park
Ealand, Mr. A. N. ..... " "
*Edwards, Mr. F. G., F.R.C.V.S...5 Newgate street
Edwards, Mrs. E. Lloyd .....Bryn Oerog, near Llangollen
Edwards, Mr. C. P. .....Officer in charge, Marconi Telegraphs, Sable Islands, Halifax, N.S.

Eggers, Miss .....42 Hough green
Eggington, Mr. R. H. .....32, St. Martin's fields
Eggington, Mrs. ..... " "
Elliott, Dr. John, B.S., B.Sc.....24 Nicholas street
Elliott, Mrs. ..... " "
Elliott, Miss .....2 Baths street
Ellis, Mr. R. J. .....60 Foregate street
Ermen, Mr. C. A. .....4 Upper Northgate street
Errington, Mr. J. H. .....22 Lightfoot street, Hoole
Evans-Lloyd, Col., J.P. .....Stanley House
Evans, Mr. Geo. H. .....The Limes, Lumley road
Evans, Mrs. .....54 Watergate street
Evans, Miss E. M. ..... " "
Evans, Miss Maria .....49 Cheyney road
Evans, Miss Emily ..... " "
Evans, Mr. A. H. .....St. George's crescent, Queen's park
Evans, Mrs. ..... " " "
Evans, Mrs. .....27 Hough green
Evans, Miss Violet ..... " "
Ewing, Mr. C. A. .....Rockcliffe, Queen's park
Ewing, Miss Alice Mabel..... " "
Ewing, Mr. Ch. G. ..... " "
Ewing, Master J. Cecil R. ..... " "

Farmer, Mr. Richard .....56 Liverpool road
Farrimond, Mr. F. T. .....Sunnyside, Boughton
Fennah, Mr. G. H. .....Watergate Row
Fennah, Mrs. ..... " "
Ferguson, Mr. W., J.P. .....The Cairn, Liverpool road
Ferguson, Miss J. M. ..... " "
Ffoulkes, Mr. Thomas B., Junr...8 Burlington road, Ipswich
Ffoulkes, Mr. Geo. B. .....15 Chichester street
Ffoulkes, Miss Jocelyn.....Kingsley Lodge, Liverpool road
Ffoulkes, Miss H. Jocelyn ..... " "
Finchett, Mrs .....9 St. Martin's Fields
Fish, Mrs. .....Arnold house, Parkgate road
*Fish, Rev. A. H., B.A., B.Sc.... " "
Fish, Mr. Cecil E., B.A., M.B., B.C.(Camb.), M.R.C.S., L.R.C.P.(Lond.) ..... } Llanbedr Hall, Ruthin, N. Wales
FitzGerald, Dr. W. A. .....Clare Lodge
Fleming, Mr. T. R. .....Rowton Grange
Fleming, Mrs. ..... " "
Fletcher, Miss .....Gleneden, Curzon park
Float, Mrs. S. M. .....20 Upper Northgate street
Fluitt, Miss .....25 Upper Northgate street
Forster, Mr. W. Angus .....Belgrave Lodge, Pulford, Chester
Francis, Mr. H. K. .....63 Bridge street row
Francis, Miss .....South Bank, Glan Aber park
Fraser, Mr. R. .....Greenbank, Eaton road
Fraser, Miss ..... " "
Frater, Mr. Geo. .....Grey Holt, Summerhill, near Wrexham
Frater, Mrs. ..... " " "
Freeman, Mr. C. E. .....Branksome, Brook lane
Freeman, Mrs. ..... " "
Frisby, Miss .....16 Chichester street

Frost, Mr. J. G., J.P. .....Boughton Hall
Frost, Mrs..... ,, ,,
Frost, Mr. J. M., J.P. .....Upton Lawn
Frost, Mrs..... ,, ,,
Frost, Mr. T. Gibbons.....Mollington Banastre
Frost, Mrs. ..... ,, ,,

Gallaher, Miss .....The Queen's School
Gamon, Mr. John .....The Quillets, Liverpool road
Gardner, Mr. E.....Saighton House, Chester
Garnett, Mrs.....The Rectory, Christleton, Chester
Garnett, Mr. J. W. .....45 Bridge street row
Garnett, Mrs..... ,, ,,
Garside, Mr. Franklin ..... ....Graianfryn, Prestatyn
Gaulton, Miss Lucy.....6 The Groves
Gibson, Major .....Buckley, *via* Chester
Gibson, Miss .....2 Paradise row
Gibson, Mr. John .....5 Abbot's nook, Victoria road
Giffen, Mr. J. T. M., F.R.C.S. ..Richmond Hill, Boughton
Gilbert, Mr. Egerton.....21 Eaton road
Gilbert, Mrs. ..... ,, ,,
Giles, Mr. E. S.....Gowymede, Vicar's Cross
Giles, Mrs. ..... ,, ,,
Glascodine, Miss .....4 King's buildings
Gleadowe, Mr. H. T. S. .....11 Stanley place
Golder, Mr. Jas. T. .....36 Hough green
*Goodman, Mr. A. E.....Oakdene, Tarvin road
Goodman, Mrs. W. ..... ,, ,,
Goodhart, Mrs. E. S. .....100 Watergate flags
Gordon, Miss F. F. .....The Limes, 54 Hough green
Gore, The Ven. Archdeacon, D.D...Bowdon, Cheshire
Gourlie, Rev. N. J. N., M.A.....The Vicarage, Weston, near Crewe
Graham, Mr. J. Menteith.....36 King street
*Granger, Mr. F. M., M.R.C.S., L.R.C.P. ..18 Nicholas street
Grantham, Rev. H..... .....S. Mary's Rectory
Grantham, Miss Gwynydd..... ,, ,,
Gray, Miss ..... .....6 Lorne street
Greenhouse, Mr. Chas. .....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S., M.B.M.S. } 31 Shrewsbury road, Birkenhead
Greig, Mrs. ..... .....Anfield, Dee banks, West
Griffin, Rev. C. A. .....The Folly, Flookersbrook
Griffin, Mrs. ..... ,, ,,
Griffith, Mr. G. R. .....Grosvenor street
Griffith, Mr. G. B.....3 Beaconsfield street
Griffiths, Mr. John .....73 Parkgate road
*Griffiths, Rev. T. T., M.A., R.N., H.M.S. "Isis" .... } Elmhurst, 1 St. John's road, Queen's park
Griffiths, Mr. Robert.....West Hey, Hough green
Griffiths, Mrs..... ,, ,,
Griffiths, Miss Bessie ..... ,, ,,
Griffiths, Mr. R., Junr..... ,, ,,
Griffiths, Mr. W. A.....3 Exton park
Griffiths, Mrs..... ,, ,,
Griffiths, Mr. John .....The Hollies, Upton park
Griffiths, Miss ..... ,, ,,
Griffiths, Miss M. J..... ,, ,,
Griffiths, Mr. T. H. .....57 Ermine road, Hoole
Grindley, Mr. J.....3 Eastgate street
Gritton, Mr. Joseph .....The Laurels, Hawarden
Grills, Dr. .....The Asylum, Chester

Gunton, Miss .....2 Church street
Giles, Miss H. .....13 Baths street
Greatbanks, Mr. J. .....Kilmorey, Hoole road

Hales, Miss.....Cop House, Sealand road
*Hamilton, Mr. A., M.R.C.S.....16 White friars
Hamilton, Mrs. ..... ,,
Hamilton, Mr. A. G., M.B.....23 Hoole road
Hamilton, Mrs. ..... ,, ,,
Hampson, Mr. R. ..... .....Halkyn road, Flookersbrook
Hannon, Miss .....92 Foregate street
Harris, Mr. T. .....Claremont, Dee banks
Harris, Mrs. ..... ,, ,,
Harris, Rev. H. .....16 Hough green
Harris, Mrs. ..... ,, ,,
Harris, Mrs. S. H. .....Dyreham, Wrexham road
Harrison, Mrs. .....Highfield, Curzon park
Harley, Mr. T. D. .....Cheyney road
Harrison, Mr. T. E. .....Maybole, 29 Victoria road
Harmshaw, Mr. Arthur .....13 Brook street
Harvey, Miss .....Fern Lea, Stamford Bridge, nr. Chester
Haselden, Mr. J. H. .....Delamere street
Haswell, Mr. G. H. .....Queen's park
Haswell, Mrs. ..... ,, ,,
Haswell, Mr. W. H. .....94 Foregate street
Haswell, Mr. Geo. W. .....28 Bouverie street
Haswell, Miss F. E. .....31 Parkgate road
Hatton, Mrs. .....Lorne street (North)
*Hawkins, Mr. J. M. .....Glan Aber Park
Heeley, Miss .....24 Moss bank, Parkgate road
Henderson, Mr. J. E. .....19 Pathway, Queen's park
Henderson, Mrs. .....9 Union Walk
Henshall, Mr. James, Junr. .....22 Bouverie street
Heppel, Miss .....39 Lord street
Heppel, Mrs. .....Windsor Lodge, Mickle Trafford
*Hetherington, Mr. T. ....Engineers' Department, The Post-Office, Glasgow
Hewitt, Mr. D. L. .....2 Hough green
Higginson, Mr. T. .....Percy road, Handbridge
Hignett, Mrs. T. H. .....Shandon, Hough Green
Hignett, Mr. H. Napier ..... ,, ,,
Hilton, Mrs. .....Talbot Hotel
Hincks, Mr. J. W. .....Brantwood, Brook lane
Hincks, Mrs. ..... ,, ,,
Hobday, Mr. Jas. .....Alexandra Villa, Liverpool road
Hobday, Mr. Wm. Edward.....22 The Groves
*Hodge, Mr. J. Philp. .....Hoole Park, Chester
*Hodges, Mr. W. .....62 Hough green
Hodgson, Mr. Wm. W. .....65 Northgate street
Hodkinson, Mr. E. .....9 Abbey street
Hogarth, Mr. T. O., M.I.Mech.E. ..The Lodge, Saltney
Houlding, Miss .....Northgate Lodge, 3 Upper Northgate st.
Holland, Miss .....7 Chichester street
Holland, Mr. W. .....Ashwood, 10 St. John's road, Queen's park
Holland, Mrs. ..... ,, ,, ,,
Holme, Rev. Canon, M.A. .....Great Budworth, Northwich
Holmes, Mr. J. G., J.P. .....Belmont, Curzon park
Holmes, Mrs. ..... ,, ,,
Holmes, Mrs. L. B. .....Ashcroft, 27A Hough green
Holmes, Mr. A. S. ..... ,, ,,
Holmes, Miss Ruth ..... ,, ,,

Holme, Mr. Samuel H. .....Downswood, Liverpool road
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopkinson, Mr. Harry .....55 Parkgate road
Hopley, Mr. J. H.....6 Northgate street
Hopley, Mrs. ..... " "
Hopton. Mr. W. A.....24 Moss bank, Parkgate road
Hopton, Mrs..... " "
Hopwood, Miss.....The Deanery
Hornby, Mr. Alex. .....Shipgate House
Hornby, Mrs... ..... "
Horner, Mr. W. .....42 Grey Rock street, Liverpool
Hostage, Mr. George B. .....30 Eaton road
Hostage, Mrs. ..... " "
Hostage, Miss .....24 Eaton road
*Howard, Mr. F. T., M A,, F.G.S...West Mount, Waverton
Howard, Mrs. ..... " "
Howard, Major-General Sir Francis, K.C.B., C.M G. ..... } Government House
Howson, Rev. J. F., M.A.....Egerton House, Upper Northgate street
Howson, Miss ..... " " "
*Howe, Rev W. Norton, M.A. ..The Parsonage, Mow Cop, Cheshire
Howick, Mr. T. S. Keith.....22 St. Martin's fields
Hubback, Miss C. J. M. .....City and County School for Girls
Hughes, Mrs. McKenny.....Ravensworth, Brooklands avenue, Cambridge
Hughes, Mr. John.....47 Victoria street, Westminster, London
*Hughes, Mr. T. Cann, M.A , F.S.A...78 Church street, Lancaster
Hughes, Mr. Petters.....19 Lorne street, North
Hughes, Mrs..... " "
Hughson, Mr. Arthur .....Surveyor, Molington, Chester
Hughes, Miss Winifred .....3 Albion buildings, Milton street
Hughes, Mr. W. H.....Moss Bank, Newton-by-Chester
Hull, Mr. G. S. N. .....51 Gladstone avenue
Humphreys, Mr. E. Noel.....Caer-y-Cael, Hoole
Humphreys, Mrs. ..... " "
Hunter, Mr. Jas. .. .....Maisonette, Hough green
Hunter, Mrs..... " "
Hutton, Mr. F. W. .....53 Greenway road, Runcorn

Illingworth, Mr. F. H. .....34 Liverpool road
Illingworth, Mrs. ..... " "
Ireland, Mr. J. D.....Kilrae, 16 Granville road

Jack, Mr. A. S. .....Belle Vue, 72 Hough green
Jackson, Miss .....52 Hough green
Jackson, Mr. Randall, M.B., M.Sc...67 Hoole road
James, Mr. Rupert F.....Arnold House
James, Mr. J. F. .....17 Mount Pleasant, Saltney
*Jebb, Mr. G. R., C.E. .....Fairyfield, Great Barr, Birmingham
Jefferson, Mr. G. A.....Meadow View, 21 Dee Banks
Jefferson, Master H. A. ..... " "
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S. } 12 Upper Northgate street
Jenner, Mr. H. A. .....11 White Friars
Johns, Mr. W. .....20 Granville road
*Johnson, Mr. M., L.D.S I.....21 York villas, Lorne street (North)
Johnson, Mr. Thomas C. .....30 Eastgate row
Johnson, Mr. Sidney M. .....18 Bouverie street
Johnson, Mrs. Mayo .....10 Lorne street
Johnson, Mr. H. P.....Endin, Newton lane

Jolliffe, Mr. H. D. .....Kilbroney, Curzon park
Jones, Miss .....3 Lorne street
Jones, Mr. Jno. .....The Spinney, Hunter street
Jones, Mrs. ..... " "
Jones, Mr. David Brellisford ....11 St. Anne street
Jones, Mr. Owen E., J.P. .....Tynrheol, Amlwch
Jones, Mr. Fred. .....112 Foregate street
Jones, Miss .....2 Hunter street
Jones, Mrs. W. H. .....Cliveden, Hough green
Jones, Miss Gertrude B. ..... " "
Jones, Mrs. Evan .....Bodrenig, Bala, N. Wales
Jones, Mrs. Wm. .....33 Cuppin street
Jones, Mr. Henry .....Gwynedd, 131 Boughton
Jones, Mr. O. R., H M.I.M.....5 Spring Gardens, Hoole
Jones, Mr. Robert W. ..... ....39 Cambrian view
Jones, Miss Mima .....3 Eastern pathway, Queen's park
*Jones, Rev. Richard, B.A.....16 Eaton road
Jones, Mr. E. B. .....30 Queen's Avenue.
Jones, Mr. R. H. .....Newton Hall
Jones, Mr. Charles .....50 Princess street
Jones, Mr. Eric Marsden .....Tilston Rectory, Malpas
Jowitt, Miss Lettice .....City and County School for Girls
Joyce, Rev. G. C., M.A. .....St. Deiniol's Hostel, Hawarden
Joyce, Rev. F. Hayward.....9 Abbey square

*Kennedy, Mr. J. B. .....Dee Bank House
Kenyon, Mr. G. A., M.B. .....Poplar House, Flookersbrook
Kenyon, Mrs. ..... " "
Kember, Miss M. .....8 The Groves
Killick, Mr. George .....Eaton, Chester
Killon, Mr. R. W. .....59 Tarvin road
Killon, Mrs. ..... " "
Kind, Mrs. .....Stoneby Drive, New Brighton
*King, Dr. H. W. .....26 Nicholas street
King, Mrs. ..... " "
*Kingsley, Miss .....Keys, Eversley, Winchfield
Knight, Miss .....8 Eastgate row
Knowles, Mr. E. R. .....15 Grosvenor street
Knowles, Miss ..... " "
Kynnersley, Mr. E. M. Sneyd ..Boughton Lodge

Lacy, Mrs. .....Moore Holme, Neston
Laing, Miss S. C.....2 Mount Pleasant, Saltney
Lamb, Mr. R., J.P. .....Oak Lea, Hoole
Lamb, Mrs. ..... " "
Lamb, Mr. R., Junr.....Yrfon, Granville road
Lamb, Mrs. ..... " "
Lamont, Mr. A. .....Oldfield road, Heswall
Lanceley, Mr. R. H. .....Victoria road
Latham, Mr. J. S. .....Green bank, Liverpool road
Latham, Mrs. ..... " " "
*Lawrence, Dr. A. .....The Asylum, Chester
Lawson, Mr. J. A. .....63 Tarvin road
Laybourne, Mr. J. H. .....21 The Groves
Laybourne, Mrs. ..... " "
Leah, Mr. W. .....Strathearn, Hoole road
Ledsham, Mr. G. .. .....Green lane, Tarvin road
Lees, Mr. W., M.R.C.S.....The Bars
Lewis, Rev. J. S., M.A.....The Vicarage, Ruabon
Lloyd, Sir Horatio, Knt.....8 Stanley place
Lloyd, Mr. F. Horatio ..... " "

*LLoyd, Colonel Wilford .....Eccleston Hill, Chester
LLoyd, Mrs. ..... ,, ,,
Lloyd, Miss M. E.....13 Chichester street
Lloyd, Miss C. .. .....62 Princess street
Lloyd, Mr. G.....38 Duke street
Lloyd, Mr. W. H.....Glenhurst, Hoole road
Lloyd, Mr. T. F. ..... ,, ,,
Lloyd, Mr. Edward .....Meillonen, Hoole road
Lloyd, Mrs..... ,, ,,
Lockwood, Mrs.....7 Queen's park
Lockwood, Miss.....6 Spring Gardens, Hoole
Lodge, Mr. Geo. T. .....St. Catherine villa, Lord street
*Longbottom, Mr. F.W., F.R A S..Haslemere, Queen's park
Longbottom, Mrs. ..... ,, ,,
Lowe, Miss C. H. .....Onneley House, Liverpool road
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. ..... } 18 Hough green
Lowe, Mrs. ..... ,, ,,
Lowe, Mr. Jas. F., B A.....Dee banks
*Lucas, Mr. A. W., F.G.S. .....4 St. John's road, Queen's park
Lund, Mr. R. S. .....12 Bridge street
Lutener, Rev. Wm., B.A.....Beech Holme, 8 Curzon park
*Lysaght, Colonel .....Watergate House

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Miss Eva, M.A. .... ,, ,,
*Macdonald, Mr. G. E., L.D.S.E...10 Bladud buildings, Bath
MacGillycuddy, Major, J.P.... { Ballinagroun House, Annascaul, R.S.O, county Kerry
MacGillycuddy, Mrs..... ,, ,,
Maddocks, Mr. Frank .....32 Upper Northgate street
Maddocks, Mrs. ..... ,, ,, ,,
Mann, Dr. A.....18 Newgate street
Mann, Mrs. ..... ,, ,,
Mann, Miss ..... ,, ,,
*Manning, Mr. J. B. .....27 Perryn road, East Acton, London W.
Marchant, Mr. W. H. .....1 Parkgate road
Marchant, Mrs. ..... ,, ,,
Marlor, Mr. Julian ..... .....Sherwood, Halkyn road, Hoole
Marriott, Mr. J. W. ..... .....The Grosvenor Museum
Marsden Miss.....6 Grosvenor Park road
Marshall, Mrs. A. .....Smithfield Cocoa House, 5 Brook street
Marsland, Miss Sarah .....43 Saughall road
Marsland, Miss Mary ..... ,, ,,
Massey, Miss .....10 Baths street
Mason, Mr. F. B. .....39 Liverpool road
Mason, Mrs. ..... ,, ,,
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
McKinlay, Mr. J. .....37 Ermine road
*McMichael, Mr. J. A., B.A., B.Sc..39 Parkgate road
McMichael, Mrs. ..... ,, ,,
Meacock, Miss .....White Friars Cottage
Meeson, Mr. W. H. .....16 Eastgate row
Mellor, Miss S. .....Burley, Queen's park
Mill, Miss F. .....26 Eaton road
Mill, Miss Frances .....St. Mary's Rectory
Millett, Mr. G. P. .....Gresford
Millington, Mr. C.....Victoria House, Victoria road
Millington, Mrs..... ,, ,,
Mills, Mrs. .....15 Chichester street
Mills, Mr. Edwd. Julian ..... ,, ,,

*Miln, Mr. G. P. .....Milnholme, Brook lane
Miln, Mrs. ..... " "
Miln, Mr. T. E..... " "
Minns, Mr. Alfred .....10 Marlborough terrace, Londonderry
Minshull, Mr. C. H. .....5 Lorne street
*Mitchell, Rev. J. C., B.D., F.R.A.S...Rutland Cottage, Parkgate road
Mond, Mr. Alfred, M.P. .....Winnington Hall, Chester
Mond, Mrs. ..... " "
Montgomery, Rev. J. K.....Abbot's villas, Liverpool road
Moore, Miss E. Crawford.....c/o of Miss Birch, 18 Upper Northgate st.
Moore, Mrs. H. .....2 Queen's park
Moreton, Mr. T. W. E., M.R.C.S...Tarvin
Morgan, Mr. Sydney.....Malpas, Cheshire
Morgan, Mr. R. T. .....2 Newgate street
*Morris, The Rev. Canon, D.D., F.S.A. } St. Gabriel's Vicarage, 4 Warwick square, London, S.W.
Morris, Miss C. .....Avondale, Halkyn road
Mosford, Mr. John .....The Righi, Tattenhall
Moss, Mr. Samuel, M.P.....50 Hough green
Moss, Mrs. ..... " "
Moss, Mr. Wm. Richardson ....The Oaks, Upton, Chester
Moss, Mrs..... " " "
Mostyn, Sir Pyers W., Bart. ....Talacre, Holywell
Mostyn-Roberts, Mrs. R. .....Bryntirion, Chester
Mott, Sergt. J. J. .....2 Panton place, Hoole
Moulton, Mr. John W.. .....Ward's terrace, Hoole
Mowle, Mr. John A..... .....Lyndale, St. John's road, Queen's park
Mowle, Mrs. ..... " " "
Munce, Miss M.....38 Eastgate row
Musgrave, Mr. J. .....45 White friars
Musgrave, Mrs. ..... " "
Musgrave, Mr. A. J..... " "
Musgrave, Miss ..... " "
Muspratt, Mr. E. J. .....Within Croft, Dee banks
Muspratt, Miss ..... " "

New, Mrs. J. M. .....The Vicarage, Backford
New, Mr. Henry .....14 Crane street
New, Mr. William J. ..... " "
Newall, Dr. W. A. .....9 Grosvenor street
Newall, Mrs. ..... " "
Newman, Mr. J. E. .....Sunny bank, Queen's park
Newman, Mrs. ..... " "
Newstead, Mrs.....Witcombe villa, Handbridge
Newstead, Mr. John Howard.... " "
*Newstead, Mr. Alfred .....The Grosvenor Museum
Nicholls, Mr. G. F. .....20 Chichester street
Niven, Mr. James .....8 Seller street
Niven, Miss ..... " "
Niven, Miss M. D. ..... " "
Nixon, Mrs. ..... .....Kingswood, 33 Victoria road
Nixon, Mr. J. G. ..... " "
Nowell, Mr. Ambrose S.....Parr's Bank, Ltd., Chester
Nutting, Miss F. A.....Gloverstone, Castle Street

Ockleston, Mr. Wm.....4 Abbot's Hayes, Liverpool road
Ockleston, Mrs..... " " "
*Okell, Mr. E. W. .....22 Northgate street
Okell, Mr. P. H. .....Wisbeach House, Glan Aber park
Oldfield, Mrs..... .....68 Northgate street

Oldmeadow, Mrs. .....25 Hawthorn villas, Hoole road
Ormsby-Gore, The Hon. Wm. ....Brogyntyn, near Oswestry
Orton, Mr. R. O., J.P. .....Tattenhall, Chester
Osborne, Mr. Geo. F. .. .....9 Sumpter pathway, Hoole
Owen, Mr. A. .....1A Halkyn road, Hoole
Owen, Mr. W. J. ..... " "
Owen, Mr. S. P. .....17 Seller street
Owens, Mr. John .....5 Grey friars

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Parker, Mrs. ..... " "
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Parry, Mrs. ..... " "
*Parry, Mr. Morys .....21 Victoria road
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Paxton, Miss ..... " "
Payne, Miss .....4 Abbey green
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Pearson, Mrs. .....Fircroft, Hough green
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Prichard, Miss .....9 The Groves
Pringle, Mr. Wm. .....30 Cambrian crescent
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Roberts, Mrs..... " "
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Roberts, Mr. Frank E., J.P. ....Sandown terrace
Roberts, Mr. W. M. .....The Shrublands, Hoole
Roberts, Miss Clara .....Washington Hotel, Chester
Roberts, Mr. W. H. .....6 Ash grove, Wrexham road
Robertson, Mr. H. R., F.R.M.S.Upton Grange
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Rogers, Mr. James .....22 Black Friars
Rogers, Mrs..... " "
Rogers, Mr. William .....104 Watergate flags
Rogers, Mr. C. W. ..... " "
Rogers, Mr. Arthur Leslie .....24 Lorne street
Rogerson, Mr. G. H. .....Polefield, Liverpool road
Rose, Mr. W. R.....4 Cathedral buildings
Royle, Mrs. .....Hough Green House
Royle, Mr. J. W.....38 Eastgate row

Sadler, Mr. James H. .....24 Albion street
Salmon, Miss Maud.....White Friars
Sangster, Mr. Chas. .....Town Hall square
Sangster, Mrs. ..... " "
Savage, Colonel .....20 Curzon park
Savage, Miss ..... " "
*Schröder, Mr. W. G., A.R.C.A...32 Eaton road
Scoaller, Mr. Walter, B.Sc. ....Lorne street (West)
Scotland, Mrs. .....Vicar's lane
Scott, Mr. John .....Brook lane
Scott, Rev. Canon S. Cooper, M.A...St. John's Rectory
Segar, Mr. F., L.D.S.E.....White Friars House
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Shand, Miss E. F. ..... " "
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*Shepheard, Mr. T., F.R.M.S. ..Kingsley, Bournemouth
Shepheard, Miss ..... " "
Shepheard, Mr. W. F. J., F.C.S...Bridge street row
Shepheard, Mrs. ..... " "
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Shone, Mr. Wm., Jun. ..... "
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*Siddall, Mr. J. D. .....23 Eaton road
Siddall, Mrs. ..... "
Siddall, Miss Annie ..... "
Siddall, Miss G. M. ..... "
Siddall, Miss Amy M..... "
Siddall, Mr. W. ..... "
Siddall, Mr. Chas. Kingsley .... "
Siddall, Mr. T. A. ..... "
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Simon, Mrs. ..... " "
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*Skeat, Miss E. G., D.Sc. .....The Queen's School
Skelton, Mr. J. M. ..... 4 Ash grove, Wrexham road
Skelton, Mrs. ..... " "
Skipwith, Mr. Francis, J.P. ....14 Curzon park
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Smith, Mr. T. .....9 White friars
Smith, Mr. Emanuel L. .....14 St. Werburgh street
*Smith, Mr. J. Kent .....32 Hough green
Smith, Mrs. ..... " "
Smith, Mr. R. Cathcart .....The Old Hall, Guilden Sutton
Smith, Mrs. ..... " "
Sparling, Rev. W., M.A. .....Upton Vicarage, Chester
Spencer, Mrs. .....4 Waterloo road
Spencer, Miss Annie .....Eastgate row
Sproule, Mr. C. R. .....7 Ashby place, Flookersbrook
Spriunt, Mrs. .....Beaconsfield, Weston, Runcorn
Stephen, Mrs. Peter.....Crosslooms, Mollington
Stevens, Mr. T. .....14 Eastgate row
Stewart, Mrs. .....13 Stanley place
*Stirling, Mr. James .....Southsea
*Stolterfoth, Dr., M.A., J.P. ....1 Grey friars
Stolterfoth, Mrs. ..... "
Stone, Miss E. M. .....Holly Bank, Cambrian view
Storr, Mr. F. .....19 The Groves
Storr, Miss. ..... "
Storrar, Miss Jessie .. .....Roseneath, Queen's park
Storrar, Mr. Andrew .....Bryntirion, Chichester street
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Sturge, Mr. F. A. .....Coed Efa, Wrexham
Stubbs, Mr. E. .....Bache Hall Gardens
Summers, Mrs. .....Bache Hall
Summers, Miss Dorothy..... " "
Summers, Miss Phyllis ..... " "

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Tasker, Mr. W. .....Moulson House, Hoole road
Tasker, Mrs. ..... " "
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Taylor, Mr. J. Reginald, B.A. .. " "
Taylor, Miss ..... " "
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Taylor, Mr. A G. .....6A Woodsome road, Highgate road, London, N.W.
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Teaves, Miss .....7 Grosvenor street
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Thomas, Miss. ..... "
Thomas, Miss Constance..... . "
Thomas, Miss F. M..... "
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Thomas, Mr. E. H. .....The Industrial Schools, Boughton
Thomas, Mr. W. C. .....56 Northgate street
Thomas, Mr. H. F. .....Roseville, Hamilton street, Hoole
Thomas, Mrs. ..... " " "
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Thomson, Miss I. .....Cambrian View
Thomson, Mr. J. R., J.P. .....Uffington House
Thomson, Mrs. ..... " "

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Thornthwaite, Miss E. M. ..... " " "
Thornthwaite, Miss H. L. ..... " " "
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Turner, Mrs. ..... " "
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Walker, Mr. Ernest ..... " "
Walker, Mr. John Stringer .....2 Abbey green
Walker, Miss Kate .....4 Grey Friars
Walley, Mrs. ..... .....Lyncroft, Raymond street
Walley, Mr. F. .....6 Abbey square
Walpole, Mr. John E. .....Holly Bank, Upton park
Ward, Miss.....Derby House, Hoole road
Ward, Mr. R. P. .....4 Hough green
Ward, Mrs..... " "
Ward, Mr. J.....Kirk Ella, Lime grove, Hoole
Warmsley, Mr. F. J.....Abbot's Holme, 69 Liverpool road
Warmsley, Mrs..... " "
Warmsley, Miss.....West Leigh, Hamilton street, Hoole
Warmsley, Miss L. ..... " " "
Way, Mr. N. A. E. .....Bradpole, 57 Liverpool road
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*Webster, Mr. G. Watmough, F.C.S., F.R.P.S. .....Grange road, West Kirby
Webster, Mr. L. F. .....c/o Mrs. Williams, 15 Cheyney road
Webster, Miss Amy B..... .....2 Nicholas street
Webster, Mrs. M. S. .....14 St. John's road, Queen's park
Webster, Miss ..... " "
Weldon, Mr. T. T. .....16 Queen's road
Wells, Mr. E.....Eccleston, Chester
Welsby, Mr. Walter.....Bosville, 25 Liverpool road
Welsby, Mrs..... " "
*Welsh, Mr. John, M.R.C.S., L.R.C.P., F.C.S...43 Tarvin road
Welsh, Mr. Wm. .....34 Tarvin road
Westminster, Her Grace Katherine Duchess of..Combermere Abbey, Whitchurch (Salop)
Westminster, His Grace The Duke of..Eaton, Chester
Westminster, Her Grace The Duchess of " "
Whalley, Mr. Percy .....Ashfield, Cambrian View
Whalley, Mrs. .. ..... " "

Wheatley, Rev. T. .....18 Eaton road
*Whichello, Mr. H., L.R.C.P., M.R.C.S...Sunnyside, Tattenhall, Chester
Whitworth, Mr. Samuel .....39 Tarvin road
Wigg, Mr. Walter J. .....The Firs, Newton
Wilkinson, Mr. R. .....51 Cambrian view
Williams, Mr. John .....Blue Bell bank, Saltney
Williams, Miss .....65 Tarvin road
Williams, Mr. R. J.....8 Eaton road
Williams, Miss Aldersey .....100 Watergate flags
Williams, Mr. James.....24 Hough green
Williams, Miss Carrie ..... " "
Williams, Mr. A. T.....15 Cheyney road
Williams, Mr. W.....Brookdale, Flookersbrook
Williams, Miss Pattie .....51 Parkgate road
Williams, Mr. R. G.....Abbey Chambers, St. Werburgh street
Williams, Mr. W. Heathcote ....Watford House, Victoria road
Williams, Mrs. ..... " "
Williams, Mr. Frank.....90 Garden lane
Williams, Mr. W. R., M.A. ....Rylease, Stocks lane
Williams, Mr. Geo. .....12 Filkin's lane, Tarvin road
Williams, Miss .....4 Alma street, Boughton
Williams, Mr. J. .....21 Pepper street
Williams, Mrs. James .....“Highfield,” Granville road
Williamson, Mr. A. J., B.A. Cantab...Brookside Villa, Hoole
Williamson, Mr. Thomas.....Cuppin street
Wiseman, Mr. H. .....77 Hoole road
Withers, Miss M. P.....7 Bridge place
Withers, Miss C. ..... " "
Wolfenden, Mr. A. .....21 Hough green
Wolfenden, Miss Marion..... " "
Wood, Mr. T. H. .....8 Hough green
Wood, Mrs. A. .....Fernleigh, Weaverham, near Northwich
Wood, Miss .....4 Waterloo road
Wright, Rev. Harold H., M.A...Precentory, Abbey street
Wright, Mrs. ..... " "
*Wynne, Mr. Geo. F. .....Plas Gwyn, Minera, Wrexham
Wynne, Mr. J. H.....49, Tarvin road
Wynne, Mrs. ..... " "
Wynne, Mr. Geo. R. ..... " "
Wynne, Mr. John Norman ..... " "
Wynne, Mr. John .....Elm Bank, Rowton, Chester

Yeadon, Mr. G. H. .....

## LIST OF JUNIOR MEMBERS

*(Under New Rule 6).*

Adams, Master Alfred James ....Ashbourne, Victoria road
Bairstow, Master Eric John.....Burley, Queen's park
Bleckly, Master .....Tentry Heys, Queen's park
Dickinson, Master Kenneth S. ..1 Upton View, Hoole
Harris, Master Stafford .....Dyreham, Wrexham road
Kind, Master R. Gordon..... Stoneby Drive, New Brighton
King, Master Wilfrid Lyle .....26 Nicholas street
Kirkland, Master Arthur.....c/o Mrs. Kenyon, Flookersbrook
Miln, Master G. Gordon .....Milnholme, Brook lane
Miln, Master J. Douglas ..... " "
Siddall, Master Frank ..... 23 Eaton road
Simpson, Master Frank Burton..10 Grosvenor street
Williamson, Miss Annie .....Cuppin street

PRESENTED

CHESTER:
G. R. GRIFFITH, PRINTER,
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CHESTER:
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MDCCCCVI.

BRITISH MUSEUM NATURAL HISTORY

# CHESTER SOCIETY of NATURAL SCIENCE LITERATURE & ART

FOUNDED BY CHARLES KINGSLEY

1871

## THIRTY-SIXTH ANNUAL REPORT & PROCEEDINGS

FOR THE YEAR

1906-1907.

## THE LIBRARY

Is open to the Members Daily from 10 a.m. to 4 p.m.; and on Thursdays (from October to May) also from 6 p.m. to 9-30 p.m.

☞ A copy of the New Library Rules is given on page 24.

*** The Catalogue of Books in the Society's Library may be obtained at 4, Eastgate Row; or from the Museum; price 3d. each.

☞ Copies of Nos. II. and III. of the Society's Proceedings (price 2/6 each); No. IV. (5/-); and No. V. (2/6); may be obtained at the Museum.

*Special attention is directed to the following recent publications of the Society:—*

(a) *A List of Lepidoptera found in Cheshire, Flintshire, Denbighshire, Carnarvonshire, and Anglesea, compiled by* G. O. DAY *and others (Proceedings No. V.) Price* 2/6 *(Post free* 2/8).

(b) "*On some Rare Arachnids captured during* 1906," *by* A. RANDELL JACKSON, M.B., M.SC. *(Part I. of Proceedings No. VI.),* 1907. *Price* 6*d.*

Copies may be obtained from the Curator at the Museum.

BRITISH MUSEUM NATURAL HISTORY

# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY 1871).

## THIRTY-SIXTH

# ANNUAL REPORT

INCLUDING

## STATEMENT OF ACCOUNTS, &c.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Ten Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other Members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any Candidate for Membership of the Society, with those of a proposer and a seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That Junior Candidates between the ages of 12 and 21 shall be admitted, at a subscription of 2/6 per annum, to all the privileges of the Society, excepting that of voting.

7.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

8.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each —except to the Annual General Meeting, to which Members only are admitted.

9.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

10.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

11.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

12.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

13.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

14.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

15.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement made up to the end of April, and duly audited, shall also be submitted, and read if desired.

16.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

17.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

18.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

19.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1907-1908.

## President:

DR. A. HAMILTON.

## Vice-Presidents:

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W. M. DOBIE, ESQ., M.D., J.P., F.R.A.S.
H. STOLTERFOTH, ESQ., M.A., M.D., J.P.
T. SHEPHEARD, ESQ., F.R.M.S.
G. R. GRIFFITH, ESQ., J.P.
J. D. SIDDALL, ESQ.
REV. A. H. FISH, B.A., B.Sc.
F. W. LONGBOTTOM, ESQ., F.R.A.S.

## Officers of Sections:

### BOTANICAL.

CHAIRMAN—MR. J. D. SIDDALL ... ... ... ... 23, *Eaton Road*
SECRETARY—MR. A. E. GOODMAN ... ... ... *Oakdene, Tarvin Road*

### ZOOLOGICAL.

CHAIRMAN—DR. W. HENRY DOBIE ... ... ... 2, *Hunter Street*
SECRETARY—MR W. F. J. SHEPHEARD, F.C.S. ... *Bridge Street Row*

### GEOLOGICAL.

CHAIRMAN—MR. A. W. LUCAS, F.G.S. ... ... ... 4, *St. John's Road, Queen's Park*
SECRETARY—MR. EGERTON GILBERT ... ... ... 21, *Eaton Road*

### NATURAL PHILOSOPHY.

CHAIRMAN—MR. G. WATMOUGH WEBSTER, F C.S. *Grange Road, West Kirby*
SECRETARY—MR. J. BAIRSTOW, F.C.S. ... ... ... *Burley, Queen's Park*

### MICROSCOPICAL.

CHAIRMAN—DR. STOLTERFOTH ... ... ... ... 1, *Grey Friars*
SECRETARY—MR. M. JOHNSON, L.D.S.I. ... ... 21, *York Villas, Lorne Street, N.*

### PHOTOGRAPHIC.

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SECRETARY—MR. FRANK SIMPSON ... ... ... 10, *Grosvenor Street*

### LITERATURE.

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SECRETARY—DR. J. T. ROBERTS ... ... ... ... *Dorchester House*

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SECRETARY—MR. F. W. LONGBOTTOM, F.R.A.S. ... *Haslemere, Queen's Park*

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SECRETARY—MR. HORACE DAVIES ... ... ... 14, *Newgate Street*

## Hon. Treasurer:

MR. JOHN SIMON, 4, *Eastgate Row*

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*General*—MR. G. P. MILN, *Milnholme, Brook Lane*
*General*—MR. FRANK SIMPSON, 10, *Grosvenor Street*

## Hon. Librarian:

MR. ALFRED NEWSTEAD, *The Grosvenor Museum*

## Committee:

THE ABOVE OFFICERS (*Ex-officio*)
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DR. JAMES TAYLOR

## Hon. Auditors:

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MR. E. NOEL HUMPHREYS, C.A.

## Curator:

MR. ALFRED NEWSTEAD, *The Grosvenor Museum.*

## Assistant Secretary:

MR. W. J. NEW

## Representatives of the Society upon the Grosvenor Museum Management Committee:

MR. J. BAIRSTOW, F.C.S.
DR. A. HAMILTON
MR. F. W. LONGBOTTOM, F.R.A.S.
MR. G. P. MILN
MR. J. D. SIDDALL
MR. JOHN SIMON

## HON. SECRETARIES' REPORT.

In presenting the Thirth-sixth Annual Statement, your Committee have pleasure in reporting a year of marked success.

During the Summer months, Excursions and Field Meetings were held as follows :—

1906.

May 16th—Delamere and Eddisbury.

,, 23rd—Lache Eyes.

,, 30th—Plemstall and Mickle Trafford.

June 13th—Evening Ramble round Helsby Hill.

,, 20th—Annual Excursion to Bala, including "Moel-y-Garnedd" (the residence of Colonel E. Evans-Lloyd, J.P.)

,, 27th—Heron Bridge Meadows—for Botany and Micro-Zoology.

July 4th—Storeton Quarries.

,, 18th—Burton Point and Woods.

,, 25th—Newton and Upton Nurseries.

Sept. 5th—Ellesmere Port—including The Galvanizing Iron Works (by kind permission of Messrs. Jones Brothers) and The Imperial Flour Mills (by kind permission of Messrs. Walley & Sanday).

,, 12th—Hawarden Park and the Old Castle Grounds (Photographic Excursion).

The attendance of members at these was equal to the average of recent years.

Altogether, thirty-one Lectures and Sectional Meetings were held during the Winter months, in accordance with the following summary :—

### GENERAL MEETINGS.

1906.

Oct. 11th—Annual Conversazione in the Town Hall.

,, 18th—"The Development of Transatlantic Navigation"—
MR. J. B. KENNEDY.
Illustrated by a large collection of Lantern Slides.

,, 25th—"The Precious Stones of the Jewish Breastplate"—
MR. HENRY DUCKWORTH, F.L.S., F.G.S.
Illustrated by Drawings and Diagrams; and a Collection of Gems from London.

1906.

Nov. 1st—"Volcanoes and Earthquakes"—
MR. F. W. LONGBOTTOM, F.R.A.S.
Illustrated by Lantern Pictures; many quite new.

Dec. 6th—"Spiders and their Allies"—
DR. A. RANDELL JACKSON, M.Sc.
Illustrated with Lantern Slides.

1907.

Jan. 31st—"Natural History Notes," or Recollections of my Indian Rambles (Third Series)—MR. JOSEPH THOMPSON.
Illustrated by numerous Lantern Slides and Specimens, including several of the "Stivens Collection."

Feb. 7th—"Chaucer's England"—MISS BEATRICE CLAY, B.A.
Illustrated by a series of Lantern Slides taken from the Ellesmere MS., Luttrell Psalter, and other sources.

Mar. 7th—"Halley's Comet, our long-expected Visitor"—MR. W. E. Plummer, M.A., F.R.A.S. (Bidston Observatory).
Illustrated by Lantern Slides.

## SPECIAL AFTERNOON LECTURES

*(for Members and Junior Members of the Society, and young people in general).*

1907.

Jan. 10th—"Light and Sight"—MR. F. M. GRANGER, M.R.C.S., L.R.C.P.
Illustrated by Lantern Slides, &c.

Demonstrations by MR. SIDDALL with the Kinematograph, the Photochromoscope, and Krömsköp.

„ 17th—"Plants and Animals of our Ponds and Ditches"—
MR. J. D. SIDDALL.
Illustrated by Lantern and Kinematograph Pictures.

Feb. 15th—"Chaucer's England" (repeated by special request)—
MISS BEATRICE CLAY, B.A.
Illustrated by a series of Lantern Slides taken from the Ellesmere MS., Luttrell Psalter, and other sources.

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1906.

Dec. 3rd to Dec. 8th. } Exhibition of Nature-Study Competitions, in the Art Gallery.

## SECTIONAL MEETINGS.

### BOTANICAL.

1907.

Jan. 10th—"Plants of the Past"—
MR. HUGH H. THOMAS (Scholar of Downing College, Camb.)
Illustrated by Lantern Slides and Specimens.

Apr. 11th—"Buttercups and Daisies"; a Study of the Natural Orders *Ranunculaceæ* and *Compositæ*—MR. J. D. SIDDALL.

## ZOOLOGICAL.

1906.

Nov. 29th—"Birds and their Nests"—DR. W. HENRY DOBIE.

Illustrated by a series of Photographs from Life, by MR. R. B. LODGE, of Enfield, representing, chiefly, the rarer British Birds in their breeding quarters on the Continent; including many taken this year in Albania, Montenegro, Hungary, and Roumania.

1907.

Jan. 24th—"The Origin and Life History of some of our Domestic Animals," including Dogs, Cats, &c.—MR. FRANK SIMPSON.

Illustrated by numerous Lantern Slides.

Feb. 28th—"Zoological Notes and Observations on the Past Year," by THE CHAIRMAN, MR. J. ARKLE, MR. SIDNEY G. CUMMINGS, DR. JACKSON, MR. R. NEWSTEAD, MR. J. THOMPSON, THE CURATOR (MR. A. NEWSTEAD), and others.

Illustrated by Lantern Slides.

## GEOLOGICAL.

1906.

Dec. 20th—"The Topography of the Roman Dee and Port of Deva"—MR. W. SHONE, F.G.S.

Illustrated with Lantern Slides.

1907.

Apr. 18th—"Theory of the Formation and Occurrence of our Coalfields"—MR. JAS. FORD, M.E., M.I.M.E. (late Science Lecturer to the County Council of Leicester).

Illustrated by Lantern Slides.

## NATURAL PHILOSOPHY.

1906.

Nov. 8th—"Colour"—MR. ARTHUR DUFTON, M.A., B.Sc.

Illustrated by Dyed Fabrics, Coloured Slides, and Spectra.

1907.

Mar. 21st—"Some Old Problems of Science in a New Light"—MR. J. BAIRSTOW, F.C.S.

## PHOTOGRAPHIC.

1906.

Nov. 9th—"Lantern-Slide Making, by contact and reduction" —MR. FRANK SIMPSON.

,, 23rd—"Enlarging Simplified" (by Messrs. Griffin & Sons, Limited)—Demonstrated by MR. J. A. MCMICHAEL, B.A., B.Sc.

Dec. 7th—Conversational Meeting.

1907.

Jan. 17th—"Nature Study with a Camera"—DR. C. THEODORE GREEN, F.L.S., &c.

Illustrated by about 70 Lantern Slides.

Feb. 1st—"What can be done with a Hand-Camera"—THE SECRETARY (on behalf of Messrs C. P. Goerz, London).

1907.
Feb. 21st—"Holiday Reminiscences"—
MR. F. W. LONGBOTTOM, F.R.A.S.
Illustrated by a series of Photographic Pictures.

Mar. 1st—Exhibition of The Affiliation of Photographic Societies' 1906 Prize Lantern Slides.

,, 14th—"Recent Advancements in Photography"—
MR. HARRY WADE (on behalf of Messrs. Wellington & Ward).
Illustrated by Lantern Slides.

LITERATURE.

1906.
Nov. 22nd—"Spanish Contemporaries of Shakespeare"—
MR. JAMES M. GRAHAM.

1907.
Feb. 14th—"Some Aspects of Wit and Humour"—
MR. A. E. LOVELL, M.A.

ASTRONOMICAL.

1906.
Dec. 13th—"Astronomy as a Hobby"—MR. R. C. JOHNSON, F.R.A.S. (Hon. Secretary of Liverpool Astronomical Society).

An increasing interest is shewn by members in these Lectures and Sectional Meetings; and, good as the average attendances are, your Committee believe that these would be still better if the Lecture Theatre was capable of seating greater numbers.

The Conversazione was a most successful function in every way. There was a more numerous display of Microscopic exhibits than has been the case in recent years; whilst Mr. Thompson's exhibit of Fungi was exceptionally complete, and excited great interest and admiration. A new and pleasing feature was an excellent exhibit of Pictures, chiefly Watercolours, organized by the President.

The total membership of the Society at present stands at 1,072, made up as follows:—

| | |
|---|---|
| Honorary Members .. .. .. | 29 |
| Corresponding ,, .. .. .. | 27 |
| Ordinary ,, .. .. .. | 964 |
| Junior ,, .. .. .. | 52 |
| Total .. .. .. .. | 1,072 |

Since the introduction of the new rule admitting Junior Members, not less than fifty-two have been enrolled. The increase, it is satisfactory to notice, has been

accompanied by a further improvement in the quantity and quality of the work done for the Kingsley Memorial Prizes.

To encourage still further this greatly increased interest in Natural History and Nature Study amongst the Junior Members, the Curator has commenced a series of Exhibits of British Flowers growing in the neighbourhood of the City, which will be continued in the Art Gallery of the Museum during the Summer months.

This exhibition has already met with much success, and not a few of our younger members have already given their services towards its completion.

It is also hoped to include Entomological and other exhibits bearing upon the *Flora* and *Fauna* of the district; and any contributions for these exhibits will be welcomed by the Curator.

The Committee see with much satisfaction, the growing desire among our boys and girls to observe more closely, and to become better acquainted with, the beautiful and interesting field which Nature offers to their eyes, and which affords so much scope for the cultivation alike of mental and moral faculties; and they appeal to parents and teachers to help and encourage a movement which can do so much to remedy some of the worst defects of our modern life.

Your Committee have met fourteen times during the past year, and these Meetings have been well attended by the members and Sectional Officers.

Although there has during the past year been extraordinary expenditure of nearly £30, which includes the cost of the new Honours Boards in the Library, the Treasurer has been able to carry forward a small balance to next year's Account, which shews that the Society's finances are in a healthy condition.

GEORGE P. MILN, } *Hon. Gen.*
W. F. J. SHEPHEARD, } *Secretaries.*

GROSVENOR MUSEUM,
MAY, 1907.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1907.

| Dr. | £ s. d. | £ s. d. |
|---|---|---|
| By Balance from last year ... ... ... .. | | 13 7 0 |
| ,, 903 Subscriptions for year 1906-7 at 5/- ... ... | 225 15 0 | |
| ,, 19 Arrears ,, 1905-6 at 5/- ... ... | 4 15 0 | |
| ,, 3 ,, ,, 1904-5 at 5/- ... ... | 0 15 0 | |
| | | 231 5 0 |
| ,, 52 Junior Subscriptions for year 1906-7, at 2/6 ... | | 6 10 0 |
| Subscriptions unpaid— | | |
| 49 for 1906-7 at 5/- ... ... £12 5 0 | | |
| 16 for 1905-6 at 5/- ... ... 4 0 0 | | |
| ,, Gross Receipts from Excursions— | | |
| Delamere and Eddisbury ... ... ... | 1 12 3 | |
| Annual Excursion to Bala ... ... ... | 18 14 6 | |
| Storeton Quarries ... ... ... ... | 1 10 0 | |
| Burton Point and Woods ... ... ... | 3 4 2 | |
| Ellesmere Port ... ... ... ... | 2 14 0 | |
| | | 27 14 11 |
| ,, Gross Receipts from Conversazione ... ... | | 15 6 8 |
| ,, ,, ,, Lectures and Sectional Meetings | | 2 13 0 |
| | | £296 16 7 |

| Cr. | £ s. d. | £ s. d. |
|---|---|---|
| To Museum Management Committee... ... ... | | 75 0 0 |
| ,, Natural History Museum and Library ... ... | | 20 12 7½ |
| ,, Postages ... ... ... ... ... ... | | 32 17 9½ |
| ,, Printing, Stationery, and Advertising ... ... | | 53 10 9 |
| ,, Expenses in connection with Excursions— | | |
| Delamere and Eddisbury ... ... ... | 1 11 6 | |
| Annual Excursion to Bala ... ... ... | 18 18 3 | |
| Storeton Quarries ... ... ... ... | 1 7 8 | |
| Burton Point and Woods ... ... ... | 3 4 0 | |
| Ellesmere Port ... ... ... ... | 2 8 0 | |
| | | 27 9 5 |
| ,, Lectures, Evening Meetings, &c.— | | |
| Conversazione ... ... ... ... | | 20 18 4 |
| Fees to Lecturers and Sundry Expenses ... | | 7 14 6 |
| ,, Salary to Assistant Secretary ... ... ... | | 15 0 0 |
| ,, Cost of New Honours Boards placed in the Library | | 10 15 0 |
| ,, Three Enlarged Photos for Library ... .. | | 6 6 0 |
| ,, Donation to Rev. J. Cairns Mitchell's Testimonial Fund ... ... ... ... ... ... | | 5 5 0 |
| ,, Subscriptions— | | |
| Ray Society ... ... ... .. ... | 1 1 0 | |
| Royal Photographic Society ... ... ... | 1 1 0 | |
| Palæontographical Society ... ... ... | 1 1 0 | |
| | | 3 3 0 |
| ,, Lantern Account ... ... ... ... | | 14 16 0 |
| ,, Collecting outstanding Subscriptions ... ... | | 2 2 0 |
| Balance in hand ... ... | | 1 6 2 |
| | | £296 16 7 |

Examined with the Accounts and Vouchers relating thereto and found to be correct, shewing a balance in the Hon. Treasurer's hands of £1 6s. 2d

BERESFORD ADAMS,
E. NOEL HUMPHREYS, A.C.A., } Hon. Auditors.

Chester, 7th May, 1907,
JOHN SIMON, Hon. Treasurer.

# CURATOR AND LIBRARIAN'S REPORT.

In submitting this Report, your Curator has pleasure in stating that, for the most part, the additions to the Society's Museum during the past year are of a most important character.

An unusually fine specimen of the Black Rhinoceros *(Atelodus bicornis)*, shot by His Grace The Duke of Westminster in East Africa, has been presented by His Grace to the Society's Museum. The colour of this animal is not black as its name implies, but a dirty brown, and the name is only given to it to distinguish it from its enormous relative, the Burchells or White Rhinoceros, an animal which has, I believe, never yet been seen alive in captivity, and as it is now nearly extinct, most probably never will. The living species of Rhinoceros are native only to Africa and Southern Asia, although, as shown by geological evidence, animals of the kind were once very widely distributed; and some of them inhabited Great Britain. The group is known to have originated in North America. The common Indian species ranges from Bengal to Cochin China, and is distinguished by the possession of a single horn upon the nose, and armour-like folds in the thick skin.

The additions to the birds includes a specimen of the Hoopoe *(Upupa epops*, Linn.), procured at Saltney in August 1906, and presented by Mr. T. H. Hignett. Two specimens are recorded in Dr. W. H. Dobie's List of Birds of Cheshire and North Wales (Proceedings IV., p. 310). The range of this species outside the British Isles is generally distributed throughout Southern Europe, and nesting in the Mediterranean countries, and in Central Europe, as far north as Denmark and Southern Sweden. The winter home of the Hoopoe is in North-eastern Africa; the Central Asian individuals doubtless winter in North-western India.

Another addition worthy of special mention is that of the Hobby Hawk *(Falco subbuteo*, Linn.), procured at Tarvin, near Chester, in August 1906, and presented by Mr. Arthur Newstead. This is a migratory species, and is found most usually in the southern, western, and midland counties of Great Britain, from May to September.

A new Life-history Group of the Puffin *(Fratercula arctica*, Linn.) has been prepared and mounted by your Curator from material and specimens collected on Puffin Island, where an isolated colony of these birds nest annually.

A specimen of the Large-tailed Blue Butterfly *(Lampides bœticus*, Linn.) has been presented to the Society's collections of *Lepidoptera* by its captor, Mr. J. W. Macfie. This specimen was taken at Heswall in 1886 or 1887.

It is one of the rarest of British Butterflies, and the few authentic captures of this species in the British Isles have, with the exception of the specimen taken in Wirral by MR. MACFIE, all been met with in the southern counties during the month of August. No previous record has been given of the Cheshire specimen, it having been overlooked by the authors of Day's List of the *Lepidoptera;* although the specimen in question was, shortly after its capture, submitted to and identified by the late Curator (Mr. R. Newstead).*

MR. J. ARKLE has also added considerably to the *Lepidoptera*, including several species new to the collections. To the *Coleoptera*, MR. BROCKTON TOMLIN has added a large number of species, new both to the district and the collections.

By invitation of the Museum Management Committee, a fresh course of Nature-study lessons, to children recruited from the Higher Elementary Schools of the City, commenced on April 15th, and will continue over a period of about eighteen weeks, ending on or about the second week in August next. The subjects chosen are as follows:—

1. The Honey Bee.
2. British Snakes.
3. Owls and Hawks.
4. Humming Birds.
5. British Bats.
6. The Seal, Badger, and Squirrel.

Thirty-six lessons were given last year 1906 by your Curator, the total number of attendances being, approximately, 1,260. The lessons were fully illustrated by specimens selected from the Society's Museum, and by living examples whenever it was possible to procure them; and also by lantern photographs.

A complete list of the Donors and the Additions are appended below:

MR. HUGH ALDERSEY—1 *Clytus arietus.*

MR. J. ARKLE—8 species; 22 specimens of *Lepidoptera.*

MR. R. ATCHERLEY—Eggs of Gannet, Eider Duck, Guillemot; Adult Male Fox *(Canis vulpes*, Linn.)

MR. BAIRSTOW—Kingfisher *(Alcedo ispida*, Linn.)

MR. N. F. BARNES—Malformed Hen's Egg.

MR. HENRY BEASLEY—Cast of footprints, Storeton (A 4).

* MR. R. NEWSTEAD gives me the following abstract from his diary in reference to this species:—"*Lampides boticus* taken at Heswall, Cheshire, in the fields by the shore, in the years 1886 or 1887, by MASTER JACK W. S. MACFIE, Rowton Hall, Chester. Tails perfect, but minus body and head; wings split, but otherwise not very much worn; right fore-wing detached (recently), but replaced by me; metallic scales on eye-spots, beneath very bright, and not in the least worn. Set on a No. 1 pin, English make. The above note I made to-day, July 20th, 1892, from the specimen recorded above, which is still in the possession of MASTER MACFIE . . . I have cross-questioned him about the Insect. He is not quite certain which of the two years, 1886 or 1887, it was taken, and is not certain also whether he or his sister caught it, but they were together when it was taken . . ."

MR. T. A. COWARD—Head of Tinamou *(Caledroma vulgaris)*; specimens of *Monomorium pharaonis* and Larva of *Athalia scutellariæ*.

COL. BRYAN G. DAVIES COOKE—Series of *Cionus scrophulariæ*.

THE CURATOR—Larva of Goat Moth *(Cossus ligniperda)*; 2 species of *Hymenoptera*; 10 species of *Coleoptera*; 1 species of *Cicadæ*; 4 specimens of *Stomoxys calcitrans*; specimens of Millipedes and Centipedes.

MR. GUY FEILDEN—Collection of Shells, pressed Plants, and Eggs.

MR. T. H. HIGNETT—Hoopoe *(Upupa epops*, Linn.)

MR. ITHELL—Specimens of *Turritella sp.?*; *Pupura lapillus*; and fragment of *Cardium sp.?*

MR. E. M. JONES—2 species Diptera *(Bibio sp.?)*

MR. W. A. JONES—Hare *(Lepus timidus)*, immature.

DR. LUNT—Quartz Crystals.

MR. J. W. S. MACFIE—*Lampides bæticus*, Linn.

MR. NAYLOR—Nest and Eggs of Greenfinch (variety).

MR. ARTHUR NEWSTEAD—Hobby Hawk *(Falco subbuteo*, Linn.)

MR A. C. NICHOLSON—6 species of Graptolites (Hartfell types).

MR. CHARLES OLDHAM—Sawfly *(Sirex juvencus)*.

MR. S. STENDALL—Immature Robin *(Erithacus rubecula)*.

MR. BROCKTON TOMLIN—15 species; 34 specimens of *Coleoptera*.

HIS GRACE THE DUKE OF WESTMINSTER—Black Rhinoceros *(Atelodus bicornis)*.

MR. HENRY BEASLEY—Six Photographs of "*Cheirotherium stortonense*" of different ages.

## ADDITIONS TO THE SOCIETY'S LIBRARY 1906-7.

*Athalia scutellariæ* in Cheshire. Reprint from the E.M. Magazine, October 1906, by T. A. Coward. *Donor*, Mr. R. Newstead.

Bristol Museum and Art Gallery, Report, September 1906.

Bristol Museum and Art Gallery, "Development of the Institution, 1772-1906," by W. R. Barker. *Donor*, The Author.

*Bristol Naturalists' Society, Proceedings, Vol. I., Part II., 1906.

"British Tunicata," by the late Joshua Alder and the late Albany Hancock, Vol. II. (Ray Society), 1907. By purchase.

British Association, Annual Report (South Africa), 1905.

British Association, Report of the 76th Meeting (York), August 1906.

*Boletin del Institute Geologico de Mexico, No. 22, 1906.

Bolton Museum and Meteorological Observatory Report, 1906.

Cardiff Museum Report, March 1906.

*Cardiff Naturalists' Society, Transactions, Vol. XXXVIII., 1905.

Catalogue of British Birds' Eggs in Altrincham Museum, 1906. *Donor*, The Curator.

Carboniferous succession below the Coal Measures: North Shropshire, Denbighshire, and Flintshire, by Wheelton Hind and John Stubbs, 1906. *Donor*, The Curator (A. Newstead).

Chester Society of Natural Science, Literature, and Art, 35th Annual Report, 1905-6.

Chester Societies, Nos. 1-12, 1888-9. *Donor*, Dr. H. Stolterfoth.

*Cold Spring Harbor Monographs, "Behaviour of the Pond Snail," 1906.

*Colorado, University Studies, 1906.

Dorset Natural History and Antiquarian Field Club, Vols. XXVI., XXVII., 1905-6. *Donor*, Mr. Thos. Shepheard.

*Ealing Scientific and Microscopical Report and Transactions, 1905-6.

"Entomologist," 1906. By purchase.

*"Essex Naturalist," 1906.

*Glasgow Naturalists' Society, Transactions, Vol. VI., Part 3; Vol. VII., Parts 1 and 2; 1903-4-5.

*Hertfordshire Natural History Society and Field Club, Vol. XII., Parts 7, 8, 9, 1906.

*"Hull Whaling Relics," by Thos. Sheppard and John Suddaly, 1906.

Hull Museum, Catalogue of Antique Silver of Exhibition at, 1906.

Hull Museum, Guide, by T. Sheppard, 1907.

*Hull Museum, Quarterly Records of Additions, 1906.

"Irish Naturalist, 1906. *Donor*, Mr. Chas. Oldham.

*Index of Mycological Writings of C. G. Lloyd, Cincinnati, Ohio, U.S.A., 1898-1905.

Ipswich Museum, Free Library, and Christ Church Mansion, 57th Annual Report, October 1906.

*Lancashire and Cheshire Entomological Society, 30th Annual Report, 1906.

Letters, *re* the Heronries of Cheshire and North Wales, by Mr. R. Newstead. *Donor*, The Author.

Liverpool Observatory, Bidston, Report of the Director for year 1905.

*Liverpool Naturalists' Field Club, Annual Report, 1906.

*Liverpool Astronomical Society, Transactions, 1905.

Liverpool Astronomical Society, Annual Reports, 1902-07. *Donor*, Mr. F. W. Longbottom.

*Liverpool, Proceedings of Geological Society, Vol. X., Part 2, 1906.

*London Geologists' Association, Proceedings, Parts 7—11, 1906-7.

*Manchester Microscopical Society, Annual Report and Transactions, 1905.

Manchester, Memoirs and Proceedings of Literary and Philosophical Society, Vol. L., 1905-6. *Donor*, Mr. Chas. Oldham.

*Manchester Field Naturalists' Society, 45th Report and Proceedings, 1905.

"Malay Magic," by W. W. Skeat, Vol. I., 1900. *Donor*, Dr. J. G. Taylor.

*Mexico, Paregones del Institute Geologico de, Vol. I., No. 10, 1906.

*Missouri Botanical Garden, 1906.

*"Montana Coal and Lignite Deposits," by Jesse Parry Rowe, 1906.

*"Montana, Butterflies of," by Morton J. Elrod, 1906.

*Montana, President's Report of the University of, 1904-5.

*Montana, List of Fishes of, by J. A. Henshall, 1906.

"Museums' Journal," 1906. By purchase.

*"Mycological Notes and Writings," by C. G. Lloyd, 1906.

"Naturalist," 1906. By purchase.

*North Staffordshire Field Club, Annual Report, 1905-6.

*North Hants, Natural History Society Journal, Nos. 105-108, March—December 1906.

Norwich Museum Report, 1906.

*Nottingham Naturalists' Society, 54th Annual Report and Transactions, 1905-6.

Original Portraits of Linnæus. Extract from Proceedings of the Linnean Society, by W. Carruthers. *Donor*, The Author.

"Pagan Races of the Malay Peninsula," by Skeat and Blagden, Vols. I. and II., 1906. *Donor*, Dr. J. G. Taylor.

Palæontographical Society, Vol. LX., 1906. By purchase.

Photographs of the Groups of Birds in the Grosvenor Museum, by G. Watmough Webster; mounted by R. Newstead. *Donor*, Dr. H. Stolterfoth.

*Smithsonian Institution, Annual Reports of the Board of Regents, 1905-6.

*Smithsonian Institution, Annual Report, 1904-5.

*Southport Society of Natural Science, Reports 10 and 11, 1904-6.

"Spinal Cord, on certain changes in sensation, associated with gross legion of the," by Theodore Thompson. *Donor*, Mr. F. W. Longbottom.

*"Tylostomeœ," by C. G. Lloyd, February 1906.

Warrington, County Borough Report, 1906.

Wilberforce Museum, Guide, 1907.

*Yorkshire Naturalists' Union, Transactions, 30-33, 1903-6.

"Zoologist," 1906. By purchase.

Marked * are by exchange.

ALFRED NEWSTEAD,
*Curator and Librarian.*

MAY 16th, 1907.

# RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN IN CHESTER DURING 1906.

By the Rev. J. Cairns Mitchell, B.D., F.R.A.S.

The results here given are deduced from observations of the standard instruments, taken twice daily, at 9·0 a.m. and 9·0 p.m. local mean time. Returns are sent to the Royal Meteorological Society, the Meteorological Council, the Scottish Meteorological Society, and many private observers in different parts of the Empire.

## NOTEWORTHY PHENOMENA OF 1906.

Greatest atmospheric pressure..... 30·815 in., 5th April

Least ,, ,, ..... 28·617 in., 10th February

Hottest day in shade..... 90·6 degrs., 1st September

Coldest night in shade ..... 22·7 degrs., 26th December

Greatest range of temperature in 24 hours..... 35·6 degrs., 11th April

Least ,, ,, ,, ..... 4·0 degrs., 1st January

Hottest day in sun..... 129·6 degrs., 6th August

Coldest night on ground .....

Greatest excess of open air temperature over shade temperature, 65·6 degrs., 27th May.

Greatest difference between lowest temperature in shade and on ground,

Greatest Rainfall on any one day, 1·060 inches, 5th January.

Latest early Summer frost in shade, 4ft. above ground, 5·0 degrs., 28th April.

Earliest Autumn frost ,, ,, ,,

Severe gales, 3rd February and 25th August.

Snow fell on 6 days in December.

Thunderstorm in November.

Greatest number of consecutive days on which rain fell: 14 days, 25th April to 8th May.

Greatest number of consecutive days on which no rain fell: 15 days, 23rd March to 6th April.

Sunniest day of the year,

Welsh hills at 9-0 a.m.—These were only visible on one-fourth of the days of the year; 58 days clearly, and 32 very clearly seen.

## EXPLANATIONS.

*Local Mean Time* is used for the regular observations.

*The Barometer* readings, taken at 9 a.m. and 9 p.m., are corrected and reduced to sea-level and 32·0° Far.

*The Approximate Mean Temperature* is the mean of the maximum and minimum read at 9·0 a.m., and found by multiplying their difference by the Meteorological Office co-efficient, and adding the product to the minimum.

*Temperature in Sun* read at 9 a.m., and placed to previous day.

*Ground Temperatures* read twice daily at 9·0 a.m. and 9·0 p.m. The lowest reading for the 24 hours, ending at 9·0 a.m., is entered to the previous day.

*Underground Temperatures* taken daily at 9.0 a.m. The air temperature is given for purposes of comparison.

*The Relative Humidity* is calculated by dividing the mean elastic force of Aqueous Vapour, at the temperature of the Dew point (as determined by Glaisher's Factors), by that corresponding to the temperature of the air (*i.e.*, the Dry-bulb reading).

*The Rain* is measured at 9·0 a.m., and the amount entered to the previous day. A fall of 0·006 inch and above constitutes a day of rain. When any snow falls, the day is counted as a day of snow.

When the mean of the 9·0 a.m. and 9·0 p.m. observations of the amount of *cloud* is less than 2·0, it is called a day of clear sky; if the mean is above 8·0 an overcast day.

The *Wind* direction is taken by means of a Compass Nephoscope, from the drift of the lower clouds.

When the *Force of the Wind* is 7 and above (on Beaufort's Scale 0—12), it is accounted a Gale.

*Sunshine Record.*—The photographic traces are fixed *before* being measured.

*Fog, &c.*—The fog, haze, &c., are made from the visibility of objects and lights at definite distances from Rutland Cottage.

# BRIGHT SUNSHINE (SIMPLEX RECORDER), AND CLOUD.

| Month. | Bright Sunshine. Hours ending Local Apparent Time of each Day of the Month. Forenoon. 6 | 7 | 8 | 9 | 10 | 11 | Noon | Afternoon. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Monthly. Total Hours. | Greatest Possible Percentage. | No. of Days without. | Seasons. Hours and Percentage. | Cloud (1—10). 9 a.m. | 9 p.m. | Daily Mean. | No. of days Overcast. | Clear. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. ... | | 1·00 | 1·08 | 3·41 | 7·26 | 10·30 | 12·15 | 10·85 | 10·41 | 2·99 | ·75 | ·33 | | | | 60·53 | 25·0 | 7 | Winter | 7·0 | 6·3 | 6·6 | 12 | 4 |
| Feb. ... | | | ·08 | 3·90 | 9·75 | 11·58 | 15·51 | 15·91 | 18·15 | 18·83 | 11·66 | 1·33 | | | | 106·70 | 39·3 | 3 | | 7·5 | 6·0 | 6·8 | 13 | 3 |
| March.. | | 5·33 | 11·75 | 12·16 | 15.01 | 15·85 | 17·66 | 17·32 | 18·91 | 14·43 | 11·16 | 4·17 | | | | 143·75 | 39·5 | 3 | Spring | 8·0 | 6·5 | 7·2 | 12 | 4 |
| April... | | 19·15 | 21·99 | 22·93 | 21·50 | 19·40 | 21·41 | 21·25 | 19·50 | 19·09 | 17·58 | 13·16 | 5·23 | | | 222·19 | 33·5 | 3 | | 5·7 | 4·4 | 5·1 | 6 | 7 |
| May ... | ·33 | 4·00 | 4·07 | 4·09 | 4·82 | 5·74 | 3·92 | 3·83 | 2·41 | 3·75 | 2·33 | 1·42 | 1·41 | | | 42·12 | 18·5 | 3 | | 8·9 | 7·6 | 8·2 | 18 | 1 |
| June ... | | | | | | | | | | | | | | | | | | | | 6·5 | 6·5 | 6·5 | 14 | 5 |
| July ... | | | | | | | | | | | | | | | | | | | Summer | 8·0 | 6·8 | 7·4 | 15 | — |
| Aug. ... | | | | | | | | | | | | | | | | | | | | 7·5 | 6·5 | 7·0 | 11 | 3 |
| Sept. ... | | | | | | | | | | | | | | | | | | | | 5·1 | 3·9 | 4·5 | 6 | 8 |
| Oct. ... | | | | | | | | | | | | | | | | | | | Autumn | 8·2 | 7·1 | 7·6 | 14 | — |
| Nov. ... | | | | | | | | | | | | | | | | | | | | 8·3 | 5·9 | 7·1 | 14 | 1 |
| Dec. ... | | | | | | | | | | | | | | | | | | | | 8·3 | 8·2 | 8·3 | 18 | — |
| | | | | | | | | | | | | | | | | | | | | 7·4 | 6·3 | 6·9 | 153 | 36 |

During Forenoon. During Afternoon.

# METEOROLOGICAL OBSERVATIONS

RUTLAND COTTAGE, 37, PARKGATE

Lat. 53° 12′ N. ; Long. 11m. 36s. W.

MONTHLY SUMMARY O

| | JAN. | FEB. | MARCH. | APRI |
|---|---|---|---|---|
| PRESSURE (reduced to 32° F., and mean sea level)— | | | | |
| Mean height at 9 a.m. and 9 p.m. | 29·879in. | 29·761in. | 30·003in. | 30·10 |
| Highest reading | 30·654in. | 30·368in. | 30·443in. | 30·81 |
| ,, ,, Date of | 22 | 7 | 19 | 5 |
| Lowest ,, | 29·122in. | 28·617in. | 29·140in. | 29·26 |
| ,, ,, Date of | 7 | 10 | 11 | 29 |
| Range | 1·532in | 1·751in. | 1·303in. | 1·54 |
| TEMPERATURE in shade (Stevenson's screen)— | | | | |
| Approximate mean | 42·3° | 38·8° | 42·3° | 45·5° |
| Climatological mean | 42·3° | 38·2° | 42·4° | 48·0° |
| Arithmetical mean | 42·2° | 38·8° | 42·5° | 46·0° |
| 9 a.m. and 9 p.m. mean | 42·0° | 37·2° | 41·3° | 44·9° |
| Mean maximum | 46·9° | 44·3° | 49·5° | 56·2° |
| Mean minimum | 37·5° | 33·3° | 35·6° | 35·7° |
| Extreme maximum | 54·7° | 50·1° | 63·0° | 68·1° |
| ,, ,, Date of | 28 | 10 | 6 | 11 |
| ,, minimum | 27·8° | 27·3° | 24·7° | 26·6° |
| ,, ,, Date of | 20 & 23 | 18 | 13 | 27 |
| ,, range | 26·9° | 22·8° | 38·3° | 41·5° |
| Mean daily range | 9·4° | 11·0° | 13·9° | 20·5° |
| Maximum daily range | 15·8° | 17·1° | 27·2° | 35·8° |
| ,, ,, Date of | 20 | 10 | 3 | 11 |
| Minimum ,, | 4·0° | 4·1° | 6·4° | 8·8° |
| ,, ,, Date of | 1 | 3 | 1 | 8 |
| Number of nights at or below 32° | 5 | 10 | 8 | 7 |
| TEMPERATURE in sun (black bulb in vacuo)— | | | | |
| Mean maximum | 61·5° | 73·5° | 82·7° | 91·8° |
| Extreme maximum | 82·3° | 85·0° | 96·8° | 112·0° |
| ,, ,, Date of | 26 | 26 | 13 | 21 |
| Greatest excess over shade maximum | 29·5° | 42·1° | 45·9° | 50·8° |
| ,, ,, ,, ,, Date of | 26 | 9 | 17 | 21 |
| Average ,, ,, ,, | 14·6° | 29·2° | 33·2° | 35·6° |
| TEMPERATURE (on short grass or snow)— | | | | |
| Mean minimum | 30·6° | 27·0° | 30·5° | 28·1° |
| Extreme minimum | 18·9° | 20·3° | 22·4° | 20·1° |
| ,, ,, Date of | 27 | 28 | 22 | 19 |
| Greatest difference from shade minimum | 11·3° | 9·4° | 10·8° | 17·3° |
| ,, ,, ,, ,, Date of | 28 | 16 | 6 | 9 |
| Mean ,, ,, ,, ,, | 6·8° | 6·3° | 4·9° | 7·6° |
| Number of nights at or below 32° | 19 | 26 | 19 | 24 |
| TEMPERATURE underground— | | | | |
| Mean at 1 foot | 40·6° | 38·9° | 41·4° | 45·1° |
| Range ,, | 6·7° | 6·0° | 6·3° | 6·3° |
| Mean at 2 feet | 41·6° | 40·5° | 42·0° | 45·2° |
| Range ,, | 3·0° | 3·7° | 4·2° | 5·1° |
| Mean at 3 feet | 42·6° | 41·6° | 41·8° | 44·7° |
| Range ,, | 2·8° | 3·0° | 3·7° | 6·0° |
| Mean at 4 feet | 43·7° | 42·7° | 42·7° | 45·7° |
| Range ,, | 1·7° | 2·2° | 1·9° | 3·1° |
| Air temperature, 9 a.m. | 41·7° | 36·8° | 42·0° | 46·8° |
| Range of ,, ,, | 21·1° | 16·9° | 23·6° | 21·8° |
| RAIN AND HUMIDITY— | | | | |
| Rainfall in inches | 4·210 | 2·020 | 1·835 | ·79 |
| ,, ,, since 1st January | | 6·230 | 8·065 | 8·86 |
| Maximum fall in 24 hours | 1·060 | ·605 | ·460 | ·25 |
| ,, ,, Date of | 5 | 26 | 1 | 25 |
| Number of days 0·01 fell | 21 | 14 | 12 | 10 |
| ,, ,, since 1st January | | 35 | 47 | 57 |
| Mean relative humidity, 9 a.m. | 90 | 93 | 86 | 77 |
| ,, ,, 9 p.m. | 90 | 88 | 87 | 85 |
| ,, ,, of both | 90 | 84 | 87 | 81 |
| Mean vapour pressure, 9 a.m. | ·237 | ·201 | ·227 | ·24 |
| ,, ,, 9 p.m. | ·242 | ·198 | ·220 | ·23 |
| ,, ,, of both | ·240 | ·199 | ·223 | ·23 |
| Mean dew point, 9 a.m. | 38·8° | 34·8° | 37·7° | 39·5° |
| ,, ,, 9 p.m. | 39·4° | 34·3° | 37·1° | 38·6° |
| ,, ,, of both | 39·1° | 34·5° | 37·4° | 39·0° |

# OF THE YEAR 1906,

ROAD, CHESTER.

ATMOSPHERIC PRESSURE, TEMPERATURES, RAIN, AND HUMIDITY.

| May. | June. | July. | August. | Sept. | October. | Nov. | Dec. | Yearly Summary. |
|---|---|---|---|---|---|---|---|---|
| ·820in. | 30·120in. | 30·026in. | 29·938in. | 30·156in. | 29·790in. | 29·868in. | 29·960in. | 29·955in. |
| | | 30·342in. | 30·424in. | 30·611in. | 30·503in. | 30·561in. | 30·676in. | 30·815in. |
| | | 9 | 28 | 27 | 25 | 11 | 21 | 5 April |
| | | 29·701in. | 29·511in. | 29·521in. | 29·251in | 29·039in. | 29·106in. | 28·617in. |
| | | 18 | 13 | 15 | 30 | 18 | 5 | 10 Feb. |
| | | 0·641in. | 0·913in. | 1·090in. | 1·252in. | 1·522in. | 1·570in. | 2·198in. |
| )·9° | 57·7° | 61·0° | 63·1° | 57·0° | 51·5° | 45·2° | 39·7° | 49·8° |
| 1·6° | 58·4° | 61·7° | 63·6° | 58·0° | 52·0° | 45·5° | 39·3° | 50·1° |
| 1·4° | 58·4° | 61·6° | 63·6° | 57·5° | 51·6° | 45·2° | 39·5° | 49·8° |
| )·5° | 57·2° | 61·3° | 62·5° | 56·3° | 50·5° | 44·6° | 39·3° | 48·9° |
| 3·1° | 67·6° | 70·6° | 72·1° | 67·4° | 58·2° | 51·1° | 44·5° | 57·2° |
| 1·6° | 49·1° | 52·6° | 55·1° | 47·5° | 45·1° | 39·3° | 34·5° | 42·5° |
| )·6° | 78·1° | 78·7° | 84·9° | 90·6° | 68·1° | 62·8° | 56·6° | 90·6° |
| 13 | 24 | 30 | 31 | 1 | 5 | 22 | 5 | 1 Sept. |
| 2·8° | 40·7° | 44·5° | 47·7° | 33·7° | 32·0° | 29·0° | 22·7° | 22·7° |
| 2 | 16 | 13 | 19 | 29 | 14 & 31 | 13 | 26 | 26 Dec. |
| ·8° | 37·4° | 34·2° | 37·2° | 56·9° | 36·1° | 33·8° | 33·9° | 56·9° Sept. |
| 3·5° | 18·5° | 18·0° | 17·0° | 19·9° | 13·1° | 11·8° | 10·3° | 14·7° |
| ·7° | 25·5° | 28·4° | 32·9° | 33·2° | 22·2° | 18·6° | 19·0° | 35·8° |
| 26 | 9 | 5 | 30 | 29 | 25 | 13 | 5 | 11 April |
| ·0° | 5·1° | 8·9° | 7·1° | 7·6° | 5·7° | 5·1° | 4·6° | 4·0° |
| 9 | 3 | 27 | 16 | 18 | 11 | 8 | 20 | 1 Jan. |
| — | — | — | — | — | 2 | 3 | 11 | 46 |
| ·2° | 108·2° | 112·0° | 108·0° | 98·4° | 79·8° | 64·6° | 53·7° | 85·8° |
| ·6° | 119·6° | 123·6° | 129·6° | 119·0° | 97·5° | 80·5° | 70·7° | 129·6° |
| 7 | 11 | 17 | 6 | 2 | 5 | 29 | 3 | 6 Aug. |
| ·6° | 53·4° | 50·6° | 49·4° | 50·4° | 40·4° | 32·8° | 27·0° | 65·6° |
| 7 | 31 | 17 | 4 | 17 | 14 | 4 | 9 | 27 May |
| ·1° | 40·4° | 41·4° | 36·0° | 32·0° | 28·2° | 13·5° | 19·2° | 30 0° |
| ·4° | 46·0° | 47·6° | 52·2° | | | | | |
| ·7° | 36·6° | 38·0° | 45·0° | | | | | |
| 5 | 14 | 11 | 3 | | | | | |
| ·8° | 7·6° | 13·4° | 10·6° | | | | | |
| 4 | 29 | 24 | 3 | | | | | |
| ·2° | 3·0° | 5·0° | 2·9° | | | | | |
| 6 | — | — | — | | | | | |
| ·1° | 55·9° | 60·1° | 51·9° | 58·6° | 52·5° | 45·6° | 41·4° | 49·4° |
| ·7° | 6·5° | 6·0° | 8·0° | 13·6° | 10·9° | 5·6° | 10·4° | 7·9° |
| ·7° | 54·8° | 58·5° | 60·9° | 59·5° | 53·7° | 47·1° | 43·6° | 49·7° |
| 3° | 5·5° | 4·7° | 3·6° | 1·3° | 6·6° | 4·0° | 8·6° | 5·5° |
| 7° | 53·1° | 56·8° | 59·3° | 58·9° | 54·2° | 48·5° | 45·3° | 49·5° |
| 9° | 5·0° | 3·6° | 1·6° | 5·6° | 4·3° | 3·9° | 6·3° | 4·2° |
| 9° | 52·0° | 55·6° | 58·4° | 58·6° | 54·8° | 49·7° | 46·7° | 49·8° |
| 5° | 4·9° | 3·2° | 1·4° | 3·8° | 3·2° | 4·1° | 4·9° | 3·8° |
| 4° | 58·4° | 63·4° | 64·3° | 57·1° | 51·1° | 44·9° | 39·2° | 49·7° |
| 2° | 18·0° | 18·1° | 16·0° | 32·4° | 26·5° | 24·8° | 27·1° | 22·2° |
| 260 | 1·225 | 1·195 | 2·485 | 1·235 | 4·210 | 1·970 | 3·440 | |
| 120 | 12·345 | 13·540 | 16·025 | 17·260 | 21·470 | 23·440 | 26·880 | 26·880 |
| 325 | ·365 | ·530 | ·515 | ·375 | ·710 | .400 | ·540 | 1·060 |
| 5 | 21 | 26 | 17 | 13 | 17 | 19 | 15 | 5 Jan. |
| 4 | 11 | 12 | 17 | 7 | 28 | 17 | 24 | |
| 1 | 92 | 104 | 121 | 128 | 156 | 173 | 197 | 197 |
| 5 | 83 | 73 | 75 | 80 | 89 | 90 | 87 | 84 |
| 0 | 80 | 83 | 84 | 86 | 91 | 90 | 90 | 86 |
| 2 | 82 | 78 | 80 | 83 | 90 | 90 | 89 | 85 |
| 321 | ·405 | ·425 | ·451 | ·371 | ·335 | ·266 | ·208 | ·370 |
| 286 | ·363 | ·414 | ·445 | ·374 | ·323 | ·262 | ·216 | ·298 |
| 303 | ·384 | ·419 | ·448 | ·372 | ·329 | ·264 | ·212 | ·334 |
| 7° | 53·0° | 54·4° | 56·1° | 50·7° | 47·9° | 41·9° | 35·5° | 44·7° |
| 7° | 50·0° | 53·7° | 55·7° | 51·1° | 47·1° | 41·6° | 36·4° | 44·1° |
| 2° | 51·5° | 54·0° | 55·9° | 50·9° | 47·5° | 41·8° | 36·0° | 44·4° |

## WIND—DIRECTION AND FORCE.

| | Force. | | | | | Direction to 8 Points of the Compass. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 9 p.m. | Mean. | Maximum. | Date of. | Prevailing Wind. | N | NE | E | SE | S | SW | W | NW | Calm. |
| January | 1·8 | 1·5 | 1·7 | 7 | 18 & 28 | NW | 1 | — | — | 6 | 3 | 8 | 11 | 15 | 18 |
| February | 1·6 | 2·3 | 1·9 | 8 | 3 | NW | 5 | 1 | 4 | 4 | — | 2 | 7 | 19 | 14 |
| March | 1·8 | 1·6 | 1·7 | 7 | 11 | W | 6 | 6 | 1 | 3 | — | 6 | 12 | 5 | 23 |
| April | 1·7 | 0·6 | 1·2 | 6 | 28 | NW | 4 | 2 | 4 | 8 | 3 | 1 | 5 | 14 | 19 |
| May | 1·9 | 0·6 | 1·3 | 4 | 5 times | SW | 4 | — | — | 2 | 3 | 13 | 2 | 7 | 31 |
| June | 0·9 | 0·9 | 0·9 | 5 | 30 | NW | 2 | 6 | — | 4 | — | 2 | 4 | 14 | 28 |
| July | 1·8 | 1·3 | 1·5 | 7 | 16 | W | 2 | — | — | 4 | 4 | 10 | 12 | 8 | 22 |
| August | 3·0 | 1·2 | 2·1 | 9 | 25 | W | 1 | — | 1 | 3 | 11 | 7 | 12 | 8 | 19 |
| September | 2·0 | 1·0 | 1·5 | 7 | 16 | W | 4 | 2 | — | 5 | 2 | 4 | 8 | 5 | 30 |
| October | 2·0 | 1·0 | 1·5 | 5 | 8 & 12 | SW | 1 | — | — | 1 | 8 | 13 | 8 | 6 | 25 |
| November | 0·9 | 1·7 | 1·3 | 7 | 19 | NW | 1 | 3 | 2 | 2 | 2 | 6 | 4 | 11 | 29 |
| December | 1·8 | 1·6 | 1·7 | 7 | 3, 5, & 12 | NW | 3 | 3 | 1 | 4 | 3 | — | 7 | 15 | 26 |
| Totals | 1·8 | 1·3 | 1·5 | 9 | Aug. 25 | NW | 34 | 23 | 13 | 46 | 39 | 72 | 92 | 127 | 284 |
| Percentages | | | | | | | 4·7 | 3·1 | 1·8 | 6·3 | 5·3 | 9·9 | 12·6 | 17·4 | 39·9 |

## NUMBER OF TIMES THE FOLLOWING PHENOMENA WERE OBSERVED.

| | At 9 a.m. or 9 p.m. or both. | | | | | At any Hour. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dew. | Hoar Frost | Welsh Hills 9 a.m. | | | Thunder-storm. | Lightning only. | Thunder only. | Corona. | Gales. | Aurora. | Snow. | Hail. | Fog. |
| | | | Invisible | Visible. Clearly | Visible. Very clearly | | | | | | | | | |
| January | 5 | 3 | 19 | 5 | 3 | — | — | — | 2 | 2 | — | — | — | 1 |
| February | 1 | 6 | 23 | 1 | 1 | — | — | — | — | 3 | — | — | — | 2 |
| March | 4 | 3 | 22 | 4 | 2 | — | — | — | — | — | — | 1 | 1 | — |
| April | 3 | — | 19 | 4 | 3 | — | — | 1 | 2 | — | — | — | 1 | — |
| May | 5 | — | 20 | 6 | 4 | — | — | — | — | — | — | — | — | — |
| June | 3 | — | 11 | 4 | 5 | — | — | — | — | — | — | — | — | — |
| July | — | — | 16 | 9 | 5 | — | — | — | — | — | — | — | — | — |
| August | 8 | — | 14 | 8 | 5 | — | 1 | 1 | — | 2 | — | — | — | 1 |
| September | 15 | — | 17 | 5 | 2 | — | — | — | — | — | — | — | — | — |
| October | 5 | — | 25 | 3 | 2 | — | — | — | 1 | — | — | — | — | — |
| November | 8 | 1 | 20 | 2 | — | 1 | — | — | — | — | — | 2 | — | 3 |
| December | — | 2 | 20 | 7 | — | — | — | 1 | 2 | 3 | — | 6 | 1 | 3 |
| Totals | 57 | 15 | 226 | 58 | 32 | 1 | 1 | 3 | 7 | 10 | — | 9 | 3 | 10 |

# KINGSLEY MEMORIAL PRIZES

ARE OFFERED UNDER THE FOLLOWING CONDITIONS :—

## CLASS I.

**To any Resident in the Society's District.**—A Prize not exceeding Ten Pounds for the best Collection of Objects, or Essays, or Notes of Observations, or Photographs illustrating the Natural Science of the Society's District.

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the Competitors.

Collections, or Essays, or Notes, must be sent to the General Secretaries on or before September 1st, and the awards will be made at the Conversazione next succeeding.

The Committee have the option of retaining successful Collections, &c., for the Society.

## CLASS II.

**In order to encourage the study of Natural History among younger Students, not exceeding 17 years of age, and residing in the Society's District. *i.e.*, Cheshire and North Wales, the following Prizes and Certificates are offered, viz. :—**

**The FIRST PRIZE in each Class will be HALF-A-GUINEA, together with the Society's Certificate.**

**Collections, Essays, or Photographs not gaining a Prize, may be awarded Certificates if found to be of sufficient merit.**

1.—For the best Collection of Leaves of Deciduous Trees. The name of the tree from which each leaf was obtained, and also its place of growth, must be given.
2.—For the best collection of dried specimens showing (1) the unopened buds; (2) the expanded bud; (3) a fully-developed leaf; (4) the flowers; (5) the fruit of the Horse Chestnut Tree.
3.—For the best account of a Natural History Ramble.
4.—For the best Collection of Land and Fresh-Water Shells; the specimens to be mounted on cards, and the locality given.
5.—For the best account of the Life-History of the Swallow *(Hirundo rustica)*.
6.—For the best Collection of Fossils.
7.—For the best account of the surface Geology of Cheshire and Flintshire, to be accompanied by a Map.
8.—For the best four Photographs of Landscape with Animals.

CONDITIONS—All the actual work must be done entirely by the Competitors, who must be under 17 years of age. Of course, assistance and instruction from Teachers and Books is permissible and desirable, but mere copied or dictated essays will be disqualified. The Essays and Collections should be sent under a *nom de plume*, accompanied by a sealed letter containing the full name and exact age of the Competitor, to the Hon. Secretaries, on or before September 1st, 1907, free of any charge.

The Collections, Specimens, &c., will be exhibited in the Grosvenor Museum after the Awards have been made, due notice of which will be sent to each Competitor. No Competitor will be allowed to take more than two Prizes or Certificates.

The awards will be made at the Society's Conversazione next succeeding the adjudication.

The Committee do not bind themselves to give the full Prize in case of insufficient merit.

Any further information required can be had on application to the Hon. Secretaries.

# KINGSLEY MEMORIAL MEDAL

ESTABLISHED 1877,

"*For having contributed materially to the promotion and advancement of some branch or department of Natural Science.*"—*Vide* Trust Deed.

1877—MRS. CHAS. KINGSLEY (In Memoriam).
1878—JOHN PRICE, M.A.
1879—SIR PHILIP DE MALPAS GREY-EGERTON BART., F.R.S.
1880—PROF. T. MCKENNY HUGHES, F.R.S.
1881—D. MACKINTOSH, F.G.S.
1882—ISAAC BYERLEY, M.R.C.S., F.L.S.
1883—GEORGE W. SHRUBSOLE, F.G.S.
1884—ALFRED OSTEN WALKER, F.L.S.
1885—JOHN DAVIES SIDDALL.
1886—HENRY STOLTERFOTH, M.A., M.D.
1887—WILLIAM SHONE, F.G.S.
1888—THOMAS SHEPHEARD, F.R.M.S.
1889—THOMAS RUDDY.
1890—REV. CHARLES WOLLEY-DOD, M.A.
1891—ROBERT NEWSTEAD, F.E.S
1892—OSMUND W. JEFFS.
1893—EDMUND J. BAILLIE, F.L.S.
1894—W. MURRAY DOBIE, M.D., F.R.A.S.
1896—REV. ARTHUR H. FISH, B.A., B.Sc.
1897—WILLIAM HENRY DOBIE, M.B.
1899—W. F. LOWE, A.R.S.M., F.I.C., F.C.S.
1900—JOSEPH ARKLE.
1901—THOMAS ALFRED COWARD.
1902—CHARLES OLDHAM.
1903—GEORGE P. MILN.
1904—GEORGE O. DAY, F.E.S.
1905—C. THEODORE GREEN, M.R.C.S., L.R.C.P., F.L.S, &c
1906—FREDERICK WILLIAM LONGBOTTOM, F.R.A.S.

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# KINGSLEY MEMORIAL PRIZES

(OF £5 AND UPWARDS)

ESTABLISHED 1877,

"*For the reward, encouragement, and the advancement of the pursuit and study of Natural Science.*"—*Vide* Trust Deed.

| | | |
|---|---|---|
| 1878 | HELEN SMITH ..... £5<br>EDWIN W. OKELL..... 5 | *Herbarium of Flowering Plants.* |
| 1879—GEORGE SHRUBSOLE ..... | 5 | *Carboniferous Fossils.* |
| 1881—E. HOPKINS..... | 5 | *Cryptogamous Plants.* |
| 1882—GEORGE SHRUBSOLE ..... | 10 | *Corals of the Mountain Limestone.* |
| 1886—ROBERT NEWSTEAD ..... | 10 | *Hymenoptera.* |
| 1887—JOHN LYON DENSON..... | 5 | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888—LILIAN E. TOMLIN ..... | 5 | *Coleoptera.* |
| 1899 | EDITH C. TOMLIN..... 5<br>W. E. SHARP..... 5 | *Diptera and Hymenoptera (Terebrantia).*<br>*Coleoptera.* |
| 1890—ALFRED J. NIXON ..... | 10 | *Land and Fresh-Water Shells.* |
| 1892—W. E. SHARP..... | 10 | *Coleoptera.* |
| 1896—ALFRED NEWSTEAD...£5 | 5s. | *Hydradephaga (Water Beetles) and Life Histories of Insects.* |
| 1897—ALFRED NEWSTEAD ..£5 | 5s. | *Life Histories of Insects.* |
| 1900—MISS M. BOWERS..... | £5 | *Collection of Botanical Specimens.* |
| 1901—A. E. GOODMAN .....£5 | 5s. | *Collection of Photo-Micrographs, with Notes and Observations.* |
| 1902—C. THEODORE GREEN ...£10 | | *Collection of 148 Microscopical Preparations and 170 Herbarium Specimens of Micro-Fungi, together with a descriptive Catalogue and Essay on same.* |
| 1906—HUGH H. THOMAS ...£8 | 8s. | *Collection of Fossil Plants from the Lower and Middle Beds of the Coal Measures of Denbighshire, together with descriptive notes of same.* |

**Amounts less than £5 are also awarded annually.**

## LAST YEAR JUNIOR PRIZES AND CERTIFICATES WERE AWARDED AS FOLLOWS:—

(*a*) *For the best description, accompanied by drawings and dried specimens, of the entire plants and dissected flowers of the Buttercup and the Daisy :—*

WILFRID ASTLEY, Pulford School, near Chester .....**First Prize and Certificate**
CHARLES BROOKES, ,, ,, .....**Certificate of Merit**
VERA WOOLWICH, ,, ,, ..... ,, ,,
MARY E. DODD, Ashton Hayes School, near Chester ... ,, ,,
EVELYN GLEAVE, ,, ,, ,, ... ,, ,,
EMILY BIRD, Bromborough School, near Chester ..... ,, ,,

(*b*) *Nature-Study Calendar of Plants first observed in bloom ; Insects first observed ; Migratory Birds and Young Birds first observed :—*

ANNIE MCDONALD MASTERTON, Appleton Thorn National School, near Warrington...**Special Prize and Certificate**
WINIFRED GLADYS ROUGHSEDGE, ,, ,, ... ,, ,,
ELSIE WRIGHT, ,, ,, ... ,, ,,
AMELIA CLARKE, ,, ,, ... ,, ,,
EDITH EMILY SWIFT, Hoylake Girls' School .....**Certificate of Merit**
NELLIE JONES, ,, ,, .....**Special Prize and Certificate for her Essay on "Meteorological Observations"**

(*c*) *For the best description of a Pond, including its Animals and Plants :—*

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F. J. ARMSTRONG, Wirral House School, Chester ..... ,, ,,
HARRY HAYWARD, ,, ,, ,, ..... ,, ,,
CARDEN LOCKWOOD, ,, ,, ,, ..... ,, ,,
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GEORGE V. TAYLOR, Wirral House School, Chester ... ,, ,,
SYLVIA THORNTON JONES, The Queen's School, Chester...**Special Certificate of Merit for "a decidedly meritorious paper"**

(*d*) *For the best description, with drawings and dried specimens, of the plant and an opened-out flower, of either the cultivated Oat or the False Oat Grass :—*

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# "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Accounts for the Year ended 30th April, 1907. **Cr.**

| 1906-7. | £ | s. | d. | 1906-7. | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| To Balance from last Account | 12 | 12 | 1 | By Prizes awarded as follows: | | | |
| ,, Dividend on Great Western Railway Company Consolidated Ordinary Stock | 15 | 6 | 4 | Mr. Hugh H. Thomas .... | 8 | 8 | 0 |
| | | | | Mr. J. A. S. Stendall .... | 3 | 3 | 0 |
| | | | | Mr. F. Burton Simpson .. | 1 | 11 | 6 |
| | | | | ,, Amount paid for Junior Prizes ..... | 4 | 4 | 6 |
| | | | | ,, Printing Account ..... | 2 | 13 | 0 |
| | | | | ,, Account for Kingsley Memorial new Medals .. | 2 | 8 | 0 |
| | | | | ,, Account for Certificates of Merit ..... | 0 | 17 | 0 |
| | | | | ,, Engraving Medal for 1906 | 0 | 2 | 0 |
| | | | | Balance ..... | 4 | 11 | 5 |
| | £27 | 18 | 5 | | £27 | 18 | 5 |
| To Balance in Bank..... | £4 | 11 | 5 | | | | |

10*th May*, 1907—Examined and found correct,

GEORGE P. MILN,
HON. TREASURER.

J. LYON DENSON,
AUDITOR.

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1.—The Library will be open daily, except on Holidays, from 10 a.m. to 4 p.m.; and from 6 p.m. to 9-30 p.m. on the evenings when the Societies meet.

2.—As the Library is intended for purposes of study and reference, Members are expected to abstain from conversation which may be disturbing to other readers.

3.—Members are requested not to replace Books on the shelves, but to give them to the attendant for replacement.

4.—No Periodicals belonging to either Society are to be taken out of the Library.

5.—The Books belonging to the Archæological Society are intended as books of reference, and must not be taken away.

6.—Books belonging to the Society of Natural Science may, with certain exceptions, be taken out by Members of the Society, under the Rules of the Society. A receipt must be given to the Librarian for all Books so borrowed.

7.—Persons who are not Members of either Society, desiring to use the Library, must present a letter of introduction from a Member, endorsed by the Secretary, or President, of the particular Society whose Books they wish to consult; such order to be available for one week only.

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*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their names are retained on the Society's Books, and their Subscriptions considered due, until notice has been given to the contrary, according to Rule* 9.

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Day, Miss ..... " " "
Delany, Mrs. .....7 Lorne street (South)
Deeley, Mr. C. H., J.P. .....Dalmeny, Saltney
Deeley, Mrs. ..... " "
Denson, Mr. W. .....21 Upper Northgate street
Denson, Mrs. ..... " "
Denson, Miss Adelaide ..... " "
Denson, Mr. J. Lyon .....4 Upper Northgate street
Denson, Mrs. ..... " "
Denson, Mr. W. H. .....Westminster park, Hough green
Denson, Mrs. ..... " " "
Denson, Mr. F. R. .....Abbot's Mount, 33 Liverpool road
Denson, Mrs. ..... " " "
Dickinson, Mr. D. .....1 Upton view, Hoole
Dickinson, Mrs. ..... " "
Dickson, Mr. Geo. A., J.P. .....Springfield, Flookersbrook
Dickson, Mr. J. H. .....St. Ives, Queen's park
Dickson, Mrs. ..... " "
Dickson, Miss .....Grey Friars House
Digby, Miss .....2 Grey Friars
*Dobie, Dr. W. M., F.R.A.S., J.P. 4 Hunter street
*Dobie, Dr. W. H., M.B. .....2 Hunter street
Dobie, Mrs. ..... " "
*Dobie, Dr. Herbert .....Northdene, Upper Northgate street
Dobie, Mrs. ..... " " "
Dobie, Mr. Douglas .....Upton House, Chester
Dobie, Mrs. ..... " "
Dod, Miss Wolley .....Dun Cynric, St. Mark's road, Salisbury
Dodd, Mr. W. .....Mayfield Cottage, 7 Vicarage road, Hoole
Dodd, Mr. Henry .....Lime Grove, Panton road, Hoole
Dodd, Mr. John .....73 Bouverie street
Dodd, Mr. James .....7 Lord street
Dodds, Mr. Arthur W., L.D.S.E. .16 Nicholas street
Donald, Mrs. .....The Cross
Douglas, Mr. C. P. .....St. Martin's House
Douglas, Mrs. ..... " "
Dowdall, Colonel A. P. .....25 Curzon park
Dowdall, Miss A. ..... " "
*Drabble, Mr. Eric, D.Sc., F.L.S. ..Hartley Botanical Laboratory, University of Liverpool
Drinkwater, Dr. H. .....Wrexham
*Duckworth, Mr. Henry, F.L.S., F.G.S. ..7 Grey Friars
Duckworth, Miss Evangeline M. E. .... " "
*Duff, Dr. J. .....5 Abbey street
*Dufton, Mr. Arthur, M.A., B.Sc. 20 Brook lane
Dufton, Mrs. ..... " "
Dunning, Mr. J. H. .....Sandon, Hoole road
Dunning, Mrs. ..... " "
Dutton, Mr. George F. .....Aldersey Grammar School, Bunbury, Tarporley
Dutton, Mr. H. B. .....Freshfield, 27 Curzon park
Dutton, Mrs. ..... " "
Dutton, Mr. Stanley G. ..... " "

Dutton, Miss M. ..... 11 Grosvenor street
Dutton, Mr. A. E. ..... 51 Frodsham street
Dutton, Mr. John ..... Littleton Hall Gardens
Dye, Mr. Alfred B. ..... Fairhazel, 30 Bouverie street

Ealand, Mrs. ..... Hovendene, Dee Hills park
Ealand, Mr. A. N. ..... " "
Edwards, Mrs. E. Lloyd ..... Bryn Oerog, near Llangollen
Edwards, Mr. C. P. ..... Officer in charge, Marconi Telegraphs, Sable Islands, Halifax, N.S.
Eggers, Miss ..... 42 Hough green
Eggington, Mr. R. H. ..... 32 St. Martin's fields
Eggington, Mrs. ..... " "
Ellington, Mr. N. B. ..... 44 Bridge street row
Elliott, Dr. John, B.S., B.Sc. ... 24 Nicholas street
Elliott, Mrs. ..... " "
Elliott, Miss ..... 2 Baths street
Ellis, Mr. R. J. ..... 60 Foregate street
Evans-Lloyd, Col., J.P. ..... Stanley House
Evans, Mr. Geo. H. ..... The Limes, Lumley road
Evans, Mrs. ..... 54 Watergate street
Evans, Miss E. M. ..... " "
Evans, Mr. A. H. ..... St. George's crescent, Queen's park
Evans, Mrs. ..... " " "
Evans, Miss Violet ..... 27 Hough green
Ewing, Mr. C. A. ..... Rockcliffe, Queen's park
Ewing, Miss Alice Mabel ..... " "
Ewing, Mr. Ch. G. ..... " "
Ewing, Mr. J. Cecil R. ..... " "

Farmer, Mr. Richard ..... 56 Liverpool road
Farquhar, Mr. J. ..... 43 Bouverie street
Farrimond, Mr. F. T. ..... Sunnyside, Boughton
Fennah, Mr. G. H. ..... 63 Watergate row
Fennah, Mrs. ..... " "
Ferguson, Mr. W., J.P. ..... The Cairn, Liverpool road
Ferguson, Miss J. M. ..... " "
Ffoulkes, Mr. Thomas B., Junr. ... 8 Burlington road, Ipswich
Ffoulkes, Mr. Geo. B. ..... 15 Chichester street
Ffoulkes, Miss Jocelyn ..... Kingsley Lodge, Liverpool road
Ffoulkes, Miss H. Jocelyn ..... " "
Finchett, Mrs. ..... 9 St. Martin's fields
Finchett-Maddock, Mrs. H. .... Cae Gwyn, Carnarvon
Fish, Mrs. ..... 4 Abbot's villas, Liverpool road
*Fish, Rev. A. H., B.A., B.Sc. ... " "
Fish, Mr. Cecil E., B.A., M.B., B.C.(Camb.), M.R.C.S., L.R.C.P.(Lond.) ..... Llanbedr Hall, Ruthin, N. Wales
FitzGerald, Dr. W. A. ..... Clare Lodge
Fleming, Mr. T. R. ..... Rowton Grange
Fleming Mrs. ..... " "
Fletcher, Miss ..... Gleneden, Curzon park
Fletcher, Miss E. B. ..... " "
Float, Mrs. S. M. ..... 20 Upper Northgate street
Fluitt, Miss ..... 25 Upper Northgate street
Forster, Mr. W. Angus ..... Belgrave Lodge, Pulford, Chester
Francis, Mr. H. K. ..... 63 Bridge street row
Frater, Mr. Geo. ..... Grey Holt, Summerhill, near Wrexham
Frater, Mrs. ..... " " "
Freeman, Mr. C. E. ..... Branksome, Brook lane
Freeman, Mrs. ..... " "

Frisby, Miss .....16 Chichester street
Frost, Mr. J. G., J.P. .....Boughton Hall
Frost, Mrs. ..... " "
Frost, Mr. J. M., J.P. .....Upton Lawn
Frost, Mr. T. Gibbons .....Mollington Hall
Frost, Mrs. ..... " "

Gallaher, Miss .....The Queen's School
Gamon, Mr. John .....The Quillets, Liverpool road
Gardner, Mr. E. .....Saighton House, Chester
Garnett, Mrs. .....The Rectory, Christleton, Chester
Garnett, Mr. J. W. .....45 Bridge street row
Garnett, Mrs. ..... " "
Garnett, Mr. J. G., M.A. .....Arnold House, Chester
Garnett, Mrs. ..... " "
Garside, Mr. Franklin .....Graianfryn, Gronant road, Prestatyn
Gaulton, Miss Lucy .....6 The Groves
Gibson, Major .....Buckley, *via* Chester
Gibson, Mr. R. M. .....Greenbank, Buckley
Gibson, Miss .....2 Paradise row
Giffen, Mr. J. T. M., F.R.C.S. ..Richmond Hill, Boughton
Gilbert, Mr. Egerton .....21 Eaton road
Gilbert, Mrs. ..... " "
Giles, Mr. E. S. .....Gowymede, Vicar's Cross
Giles, Mrs. ..... " "
Giles, Miss H. .....13 Baths street
Glascodine, Miss .....4 King's buildings
Gleadowe, Mr. H. T. S. .....11 Stanley place
Golder, Mr. Jas. T. .....36 Hough green
*Goodman, Mr. A. E, .....Oakdene, Tarvin road
Goodman, Mrs. W. ..... " "
Goodhart, Mrs. E. S. .....100 Watergate flags
Gore, The Ven. Archdeacon, D.D. ..Bowdon, Cheshire
*Graham, Mr. J. Menteith .....36 King street
Graham, Mrs. ..... " "
*Granger, Mr. F. M., M.R.C.S., L.R.C.P. ..18 Nicholas street
Grantham, Rev. H. .....S. Mary's Rectory
Grantham, Miss Gwynydd ..... " "
Gray, Miss .....6 Lorne street
Greenhouse, Mr. Chas. .....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S., M.B.M.S. } 31, Shrewsbury road, Birkenhead
Greig, Mrs. .....Anfield, Dee banks, West
Griffin, Rev. C. A. .....The Folly, Flookersbrook
Griffin, Mrs. ..... " "
Griffith, Mr. G. R., J.P. .....Grosvenor street
Griffith, Mr. G. B. .....3 Beaconsfield street
Griffiths, Mr. John .....77 Parkgate road
*Griffiths, Rev. T. T., M.A., R.N., H.M.S. "Isis" .... } Elmhurst, 1 St. John's road, Queen's park
Griffiths, Mr. Robert .....West Hey, Hough green
Griffiths, Mrs. ..... " "
Griffiths, Miss Bessie ..... " "
Griffiths, Mr. R., Junr. ..... " "
Griffiths, Mr. W. A. .....3 Exton park
Griffiths, Mrs. ..... " "
Griffiths, Mr. John .....The Hollies, Upton park
Griffiths, Miss .. ..... " "
Griffiths, Miss M. J. ..... " "
Griffiths, Mr. T. H. .....57 Ermine road, Hoole

Grindley, Mr. J. ..... 3 Eastgate street
Grills, Dr. ..... The Asylum, Chester
Grills, Mrs. ..... " "
Greatbanks, Mr. J. ..... Kilmorey, Hoole road

Haigh, Mrs. James Alfred ..... 3 The Groves
Hales, Miss ..... Cop House, Sealand road
Halliday, Mr. G. W. ..... 2 Clare Avenue, Hoole
Halsall, Miss ..... 4 Heath terrace, Boughton Heath
*Hamilton, Mr. A., F.R.C.S. ..... 16 White friars
Hamilton, Mrs. ..... "
Hamilton, Mr. A. G., M.B. ..... 23 Hoole road
Hamilton, Mrs. ..... "
Hannon, Miss ..... 92 Foregate street
Harris, Mr. T. ..... Claremont, Dee banks
Harris, Mrs. ..... " "
Harris, Rev. H. ..... 16 Hough green
Harris, Mrs. ..... " "
Harris, Mrs. S. H. ..... Dyreham, Wrexham road
Harrison, Mrs. ..... Highfield, Curzon park
Harley, Mr. T. D. ..... 41 Cheyney road
Harvey, Miss ..... Fern Lea, Stamford Bridge, nr. Chester
Haselden, Mr. J. H. ..... Delamere street
Haswell, Mr. G. H. ..... Highfield, Queen's park
Haswell, Mrs. ..... " "
Haswell, Mr. W. H. ..... 94 Foregate street
Haswell, Mr. Geo. W. ..... 28 Bouverie street
Haswell, Miss F. E. ..... 31 Parkgate road
Hatton, Mr. William ..... Figdale, 25 Lorne street (North)
Hatton, Mrs. ..... " " "
*Hawkins, Mr. J. M. ..... Fernleigh, Glan Aber Park
Hawley, Mr. John George ..... 42 Newgate street
Hayes, Mr. J. ..... Grosvenor Park Hotel
Heeley, Miss ..... 24 Moss bank, Parkgate road
Henderson, Mr. J. E. ..... 19 Pathway, Queen's Park
Henderson, Mrs. ..... 9 Union walk
Henshall, Mr. James, Junr. ..... 22 Bouverie street
Heppel, Miss ..... 39 Lord street
Heppel, Mrs. ..... Windsor Lodge, Mickle Trafford
*Hetherington, Mr. T. ..... Engineers' Department, The Post-Office, Glasgow
Hewitt, Mr. D. L. ..... 2 Hough Green
Higginson, Mr. T. ..... Engelberg, Percy road
Hignett, Mrs. T. H. ..... Shandon, Hough green
Hignett, Mr. H. Napier ..... " "
Hincks, Mr. J. W. ..... Brantwood, Brook lane
Hincks, Mrs. ..... " "
Hobbs, Mr. C. J. ..... 2 Eversley park
Hobbs, Mrs. ..... " "
Hobday, Mr. Jas. ..... Alexandra Villa, Liverpool road
Hobday, Mr. Wm. Edward ..... 22 The Groves
*Hodge, Mr. J. Philp ..... 7 Hoole Park, Chester
*Hodges, Mr. W. ..... 62 Hough green
Hodgson, Mr. Wm. W. ..... 65 Northgate street
Hodkinson, Mr. E. ..... 9 Abbey street
Hogarth, Mr. T. O., M.I.Mech.E. .. The Lodge, Saltney
Holland, Miss ..... 17 Chichester street
Holland, Mr. W. ..... Ashwood, 10 St. John's road, Queen's park
Holland, Mrs. ..... " "
Holme, Rev. Canon, M.A. ..... Great Budworth, Northwich
Holmes, Mrs. J. G. ..... Belmont, Curzon park

Holmes, Mrs. L. B. .....Ashcroft, 27A Hough green
Holmes, Mr. A. S. ..... " "
Holme, Mr. Samuel H. .....Downswood, Liverpool road
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopley, Mr. J. H. .....6 Northgate street
Hopley, Mrs. ..... " "
Hopton, Mr. W. A. .....24 Moss bank, Parkgate road
Hopton, Mrs. .. ..... " "
Hopwood, Miss .....The Deanery
Hornby, Mr. Alex. .....Shipgate House
Hornby, Mrs. ..... "
Horner, Mr. W. .....42 Grey Rock street, Liverpool
*Howard, Mr. F. T., M.A., F.G.S. ..West Mount, Waverton
Howard, Mrs. ..... " "
Howson, Rev. J. F., M.A. .....The Rectory, Guiseley, Yorks.
Howson, Miss .. ..... " "
*Howe, Rev. W. Norton, M.A. ..The Parsonage, Mow Cop, Cheshire
Howick, Mr. T. S. Keith .....22 St. Martin's fields
Howitt, Mr. J. H., M.A., LL.B., M.R.C.S., L.R.C.P. ..... } Lyme Regis, Hough Green
Hubback, Miss C. J. M. .....City and County School for Girls
Hughes, Mrs. McKenny .....Ravensworth, Brooklands avenue, Cambridge
Hughes, Mr. John .....47 Victoria street, Westminster, London
*Hughes, Mr. T. Cann, M.A., F.S.A. 78 Church street, Lancaster
Hughes, Mr. Petters .....19 Lorne street, North
Hughes, Mrs. ..... " "
Hughson, Mr. Arthur .....2 Eastgate row, North
Hughson, Mrs. .. ..... " "
Hughes, Miss Winifred .....6 Baths street
Hughes, Mr. W. H. .....Moss Bank, Newton-by-Chester
Hull, Mr. G. S. N. .....51 Gladstone avenue
Humphreys, Mr. E. Noel .....Caer-y-Cael, Hoole
Humphreys, Mrs. ..... " "
Hunter, Mr. Jas. .....Maisonette, Hough green
Hunter, Mrs. .... ..... " "
Hutton, Mr. F. W. .....53 Greenway road, Runcorn

Illingworth, Mr. F. H. .....12 Liverpool road
Illingworth, Mrs. ..... " "
Ireland, Mr. J. D. .....Kilrae, 16 Granville road

Jack, Mr. A. S. .....Belle Vue, 72 Hough green
Jackson, Miss .....52 Hough green
*Jackson, Mr. Randell, M.B., M.Sc. ..67 Hoole road
Jackson, Mrs. ..... " "
Jackson, Rev. A. E., M.A. ....The College
James, Mr. Rupert F. .....Arnold House
James, Mr. J. F. .....1 Mount Pleasant, Saltney
*Jebb, Mr. G. R., C.E. .....Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S. } 12 Upper Northgate street
Jenner, Mr. H. A. .....11 White Friars
*Johnson, Mr. M., L.D.S.I. .....21 York villas, Lorne street (North)
Johnson, Mr. Thomas C. .....30 Eastgate row
Johnson, Mr. Sidney M. .....18 Bouverie street
Johnson, Mrs. Mayo .....10 Lorne street
Johnson, Mr. H. P. .....Endin, Newton lane
Jolliffe, Mr. H. D. .....Kilbroney, Curzon park
Jones, Mr. Joseph .....7 Gladstone road
Jones, Miss .....3 Lorne street

Jones, Mr. Jno. .....The Spinney, Hunter street
Jones, Mrs. ..... " "
Jones, Mr. David Brellisford ....11 St. Anne street
Jones, Mr. Owen E., J.P. .....Tynrheol, Amlwch
Jones, Mr. Fred. .....112 Foregate street
Jones, Miss A. E. .....Higher Grade School, Hunter street
Jones, Mrs. W. H. .....Cliveden, Hough green
Jones, Miss Gertrude B. ..... " "
Jones, Mrs. Evan .....Bodrenig, Bala, N. Wales
Jones, Mrs. Wm. .....33 Cuppin street
Jones, Mr. Henry .....Gwynedd, 131 Boughton
Jones, Mr. Robert W. .....39 Cambrian view
Jones, Miss Mima .....3 Eastern pathway, Queen's park
*Jones, Rev. Richard, B.A. .....36 Eaton road
Jones, Mrs., B.A. ..... " "
Jones, Mr. E. B. .....30 Queen's Avenue
Jones, Mr. Charles .....50 Princess street
Jones, Mr. Eric Marsden.....Tilston Rectory, Malpas
Jones, Mr. George.....20 George street
Jones, Mr. W. Llewelyn .....The Oaks, Helsby
Jowitt, Miss Lettice .....City and County School for Girls
Joyce, Rev. G. C., M.A. .....St. Deiniol's Hostel, Hawarden

*Kennedy, Mr. J. B. .....Dee Bank House
Kenyon, Mr. G. A., M.B. .....Poplar House, Flookersbrook
Kenyon, Mrs. ..... " "
Kember, Miss M. .....8 The Groves
Killon, Mr. R. W. .....59 Tarvin road
Killon, Mrs. ..... " "
Kind, Mrs. .....Stoneby Drive, New Brighton
*King, Dr. H. W. .....26 Nicholas street
King, Mrs. ..... " "
*Kingsley, Miss .....Keys, Eversley, Winchfield
Knight, Miss .....8 Eastgate row
Knowles, Mr. E. R. .....15 Grosvenor street
Knowles, Miss ..... " "
Kynnersley, Mr. E. M. Sneyd ..Boughton Lodge

Lacy, Mrs. .....Moore Holme, Neston
Laing, Miss S. C. .....2 Mount Pleasant, Saltney
Lamb. Mr. R., J.P. .....Oak Lea, Hoole
Lamb, Mrs. ..... " "
Lamb, Mr. R., Junr. .....Yrfon, Granville road
Lamb, Mrs. ..... " "
Lamb, Mr. W. A. .....6 St. Anne street
Lambert, Col. W. .....Boughton Manor
Lamont, Mr. A. .....Oldfield road, Heswall
Lancaster, Mr. Arthur .....14 Weaver street
Lanceley, Mr. R. H. .....Victoria road
Latham, Mr. J. S. .....Green bank, Liverpool road
Latham, Mrs. ..... " " "
*Lawrence, Dr. A. .....The Asylum, Chester
Lawson, Mr. J. A. .....Maisonette, Vicar's Cross
Laybourne, Mr. J. H. .....21 The Groves
Laybourne, Mrs. ..... " "
Leah, Mr. W. .....Strathearn, Hoole road
Ledsham, Mr. G. .....Pearl Cottage, off Tarvin road
Lees, Mr. W., M.R.C.S. .....The Bars
Lewis, Rev. J. S., M.A. .....The Vicarage, Ruabon
Lincoln, Mr. C. .....18 Chichester street

Lloyd, Sir Horatio, Knt.....8 Stanley place
Lloyd, Mr. F. Horatio..... " "
*LLoyd, Colonel Wilford N. ....Eccleston Hill, Chester
LLoyd, Mrs..... " "
Lloyd, Miss M. E.....13 Chichester street
Lloyd, Miss C. .....62 Princess street
Lloyd, Mr. G. .....38 Duke street
Lloyd, Mr. W. H.....Glenhurst, Hoole road
Lloyd, Mrs. Edward .....Eaton road
Lockwood, Mrs. .....Fern House, Queen's park
Lockwood, Miss .....6 Spring Gardens, Hoole
Lodge, Mr. Geo. T. .. .....9 Hoole road
Lomas, Mr. A. M. .....Parr's Bank, Limited, Chester
*Longbottom, Mr. F. W., F.R.A.S...Haslemere, Queen's park
Longbottom, Mrs. ... .. ..... " "
*Lovell, Mr. A. E., M.A. .....75 Bouverie street
Lovell, Mrs. ..... " "
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. ..... } 18 Hough green
Lowe, Mrs..... " "
Lowe, Mr. Jas. F., B.A. .....47 Dee banks
*Lucas, Mr. A. W., F.G.S. .....4 St. John's road, Queen's park
Lutener, Rev. Wm., B.A. .....Beech Holme, 8 Curzon park
*Lysaght, Colonel .....Watergate House

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Miss Eva, M.A. .... " "
*Macdonald, Mr. G. E., L.D.S.E...10 Bladud buildings, Bath
Macdonald, Dr. W. G. G. .....25 White Friars
MacGillycuddy, Major, J.P....Ballinagroun, Aunascaul, R.S.O., co. Kerry
MacGillycuddy, Mrs..... " " "
Maddocks, Mr. Frank .....Briar Dene, Percy road
Maddocks, Mrs..... " "
Mann, Dr. A.....18 Newgate street
Mann, Mrs. ..... " "
Mann, Miss..... " "
*Manning, Mr. J. B. .....27 Perryn road, East Acton, London, W.
Marchant, Mr. W. H. .....1 Parkgate road
Marchant, Mrs..... " "
Marlor, Mr. Julian.....Sherwood, Halkyn road, Hoole
Marriott, Mr. J. W. .....The Grosvenor Museum
Marsden, Miss ..... 6 Grosvenor Park road
Marshall, Mrs. A. .....Smithfield Cocoa House, 5 Brook street
Marshall, Major.....The Beeches, Upton park
Marsland, Miss Sarah .....60 Gladstone road
Marsland, Miss Mary ..... " "
Massey, Miss .....10 Baths street
Mason, Mr. F. B. ..... 39 Liverpool road
Mason, Mrs. ..... " "
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
Matthews, Miss .....County Asylum, Chester
Matthews, Mr. A. E. .....5 Parkgate road
McKinlay, Mr. J. .....31 Cheyney road
*McMichael, Mr. J. A., B.A., B.Sc...39 Parkgate road
McMichael, Mrs. ..... " "
Meacock, Miss .....White Friars Cottage
Meeson, Mr. W. H. .....16, Eastgate row
Mill, Miss F. .....26 Eaton road
Mill, Miss Frances..... ....St. Mary's Rectory

Millington, Mr. C.....Victoria House, Victoria road
Millington, Mrs. ..... ,, ,,
Mills, Mrs. .....15 Chichester street
Mills, Mr. Edwd. Julian ..... ,, ,,
*Miln, Mr. G. P.....Milnholme, Brook lane
Miln, Mrs. ..... ,, ,,
Minns, Mr. Alfred ..... 10 Marlborough terrace, Londonderry
Minshull, Mr. C. H. .....5 Lorne street
*Mitchell, Rev. J. C., B.D., F.R.A.S..Brenvar avenue, Ardnadam, Argylshire
Mond, Mr. Alfred, M.P. .....Winnington Hall, Chester
Mond, Mrs. ..... ,, ,,
Montgomery, Rev. J. K. .....Abbot's villas, Liverpool road
Moore, Miss E. Crawford.....c/o Miss Birch, 18 Upper Northgate street
Moore, Mrs. H. .....2 Queen's park
Moreton, Mr. T. W. E., M.R.C.S...Tarvin
Morgan, Mr. Sydney .....Malpas, Cheshire
Morgan, Mr. R. T. .....2 Newgate street
*Morris, The Rev. Canon, D.D., F.S.A. { St. Gabriel's Vicarage, 4 Warwick square, London, S.W.
Morris, Miss C. .....Avondale, Halkyn road
Mosford, Mr. John .....The Righi, Tattenhall
Moss, His Honour Judge.....50 Hough green
Moss, Mrs. ..... ,, ,,
Moss, Mr. Wm. Richardson ....The Oaks, Upton, Chester
Moss, Mrs. ..... ,, ,, ,,
Mostyn, Sir Pyers W., Bart. ....Talacre, Holywell
Mostyn-Roberts, Mrs. R. .....Bryntirion, Chester
Mott, Sergt. J. J. .....2 Panton place, Hoole
Moulton, Mr. John W. .....24 Lord street, Boughton
Mowle, Mr. John A. .....Lyndale, St. John's road, Queen's park
Mowle, Mrs. ..... ,, ,, ,,
Mulvey, Mr. E. M. .....9 Overleigh road
Mulvey, Mr. W. E. ..... ,, ,,
Musgrave, Mr. J. .....45 White friars
Musgrave, Mrs. ..... ,, ,,
Musgrave, Mr. A. J. ..... ,, ,,
Musgrave, Miss ..... ,, ,,
Muspratt, Mr. E. J. .....Within Croft, Dee banks
Muspratt, Miss ..... ,, ,,

New, Mrs. J. M. .....The Vicarage, Backford
New, Mr. Henry .....14 Crane street
New, Mr. William J. ..... ,, ,,
Newall, Dr. W. A. .....Bolland's Court House, White friars
Newall, Mrs. ..... ,, ,,
Newman, Mr. J. E. .....1 Sunny bank, Queen's park
Newman, Mrs. ..... ,, ,,
Newstead, Mrs. .....Witcombe villa, Handbridge
*Newstead, Mr. Alfred .....The Grosvenor Museum
Nicholls, Mr. G. F. .....20 Chichester street
Niven, Miss .....8 Seller street
Niven, Miss M. D. ..... ,, ,,
Nixon, Mrs. .....Kingswood, 33 Victoria road
Nixon, Mr. J. G. ..... ,, ,,
Nowell, Mr. Ambrose S. .....Parr's Bank, Ltd., Chester
Nutting, Miss F. A. .....Gloverstone, Castle street

Ockleston, Mr. Wm. .....4 Abbot's Hayes, Liverpool road
Ockleston, Mrs. ..... ,, ,, ,,
*Okell, Mr. E. W. .....22 Northgate street
Okell, Mr. P. H. .....Wisbeach House, Glan Aber park

Oldmeadow, Mrs. .....25 Hawthorn villas, Hoole road
Orrett, Miss .....West view, Garden lane
Osborne, Mr. Geo. F. .....9 Sumpter pathway, Hoole
Owen, Mr. A. .....1A Halkyn road, Hoole
Owen, Mr. W. J. ..... ,, ,,
Owen, Mr. James .....23 Gladstone road
Owen, Mrs. ..... ,, ,,
Owens, Mr. John .....5 Grey friars
Owens, Mrs. ..... ,, ,,
Oxenbould, Mrs. .....4 Abbey street

Page, Miss .....c/o Miss Ellis, Mount Pleasant, Saltney
Parker, Miss .....City and County School for Girls
Parr, Mr. H. A. .....The Cottage, Flookersbrook
Parry, Miss .....Netherfield, 46 Eaton road
*Parry, Mr. T. S., M.B. .....10 Upper Northgate street
Parry, Mrs. ..... ,, ,,
*Parry, Mr. Morys .....37 Victoria road
Parry, Mr. Robert .....Westcote, Hoole road
Parry, Mr. Samuel .....4 Princess street
Partington, Miss A. .....Deva lodge, Prestatyn
Pate, Mr. Thomas .....29 Chichester street
Paxton, Mr. F. .....Belmont House, Dee banks
Paxton, Miss ..... ,, ,,
Payne, Miss .....4 Abbey green
Payne, Miss A. ..... ,, ,,
Payne, Mr. H. C. .....The Cottage, Eccleston
Pearson, Mr. F. C. .....Huke's Library, The Eastgate
Pearson, Mrs. .....Fircroft, Hough green
Pearson, Miss G. ..... ,, ,,
Pell, Dr. .....Panton road, Hoole
Pell, Mrs. ..... ,, ,,
Phillips, Rev. J. .....St. Barnabas' Mission House, Sibell street
*Potts, Mr. A., M.A. .....Diocesan Training College
Potts, Miss L. S. .....17 Hough green
Powell, Mrs. T. J. .....37 White friars
Powell, Miss .....38 Eastgate row
Poyser, Mr. Henry .....34 Nicholas street
Preece, Sir Wm. H., K.C.B., F.R.S. ..Penrhos, Carnarvon
Preston, Mr. A. M. .....Abbot's Grange, Liverpool road
Price, Mr. Edwin .....Sunnyside, 3 Cambrian view
Prichard, Miss .....9 The Groves
Pringle, Mr. Wm. .....30 Cambrian crescent
Proud, Miss M. H. .....Ashmount, Tarvin road
Pye, Mr. Fred A. .....Royd's Mount, Helsby
Pye, Mrs. ..... ..... ,, ,,

Raby, Mr. E. J. .....13 Vicarage road, Hoole
Read, Mrs. ..... .....Kenwyn, Dee banks
Redman, Mr. W. R., B.A. .....Inglewood, Brook lane
Reese, Mr. J. E. ..... .....39 Halkyn road
Reynolds, Mr. G. H. .....67 Liverpool road
Richardson, Mr. A. ..... .....43 Bridge street row
Rigby, Miss Honora M. .....2 Abbot's Hayes, Chester
Rigby, Mr. Thomas .....Coed Coch road, Old Colwyn
Robb, Mr. J. D. .....37 Northgate street
Robb, Mrs. ..... ..... ,, ,,
Roberts, Miss .....Bank Cottage, Neston
Roberts, Dr., J.P. .....8 Abbey square
Roberts, Miss Johnson .....West Point, 40 King street
Roberts, Mr. B. C., J.P. .....Oakfield, Upton
Roberts, Mrs. ..... .... ,, ,,

Roberts, Mr. J. Sheriff, J.P. ....The Gables, Curzon park
Roberts, Mrs. ..... ,, ,,
*Roberts, Mr. John Thos., M.B...Dorchester House, Boughton
*Roberts, Mr. E. Owen .....148 Boughton
Roberts, Mrs. .....The Nook, Westminster park
Roberts, Mr. Frank E., J.P. ....3 Sandown terrace
Roberts, Mr. W. M. .....The Shrublands, Hoole
Roberts, Miss Clara ..... ...Washington Hotel, Chester
Roberts, Mr. W. H..... 6 Ash grove, Wrexham road
Robertson, Mr. H. R., F.R.M.S...Upton Grange
Robinson, Mr. J. H. .....North and South Wales Bank
Rogers, Mr. James .....22 Black Friars
Rogers, Mrs. ..... ,, ,,
Rogers, Mr. William .....104 Watergate flags
Rogers, Mr. C. W. ..... ,, ,,
Rogers, Mr. Arthur Leslie .....24 Lorne street
Rogerson, Mr. G. H. ..... ....Polefield, Liverpool road
Rose, Mr. W. R. .....4 Cathedral buildings
Royle, Mrs. ..... ..... Hough Green House

Sadler, Mr. James H. .....24 Albion street
Salmon, Miss Maud .....39 White friars
Sangster, Mr. Chas. .....Town Hall square
Sangster, Mrs. ..... ,, ,,
Savage, Colonel..... .....20 Curzon park
Savage, Miss ..... ,, ,,
Scouller, Mr. Walter, B.Sc. ....Fernlea, Chichester street
Scotland, Mrs. .....Vicar's lane
Scott, Mr. John.....Brook lane
Scott, Rev. Canon S. Cooper, M.A...St. John's Rectory
Segar, Mr. F., L.D.S.E. .....White Friars House
Sewell, Mr. F. C. .....1 White friars
Shacklock, Miss .....3 Deva terrace
Shand, Miss E. M. .....Kingston House
Shand, Miss E. F. ..... ,, ,,
Shaw. Mr. R. G. .....6 Bridge street
*Shepheard, Mr. T., F.R.M.S. . Kingsley, Bournemouth
Shepheard, Miss ..... ,, ,,
Shepheard, Mr.W. F. J., F.C.S...Bridge street row
Shepheard, Mrs. ..... ,, ,,
Shires, Miss M.....80 Brook street
*Shone, Mr. W., F.G.S. .....Upton park
Shone, Mrs. ..... ,,
Shone, Mr. Wm., Junr. ..... ,,
Shuttleworth, Mrs. A. .....11 Bridge place
*Siddall, Mr. J. D. .....23 Eaton road
Siddall, Mrs. ..... ,,
Siddall, Miss Annie ..... ,,
Siddall, Miss G. M. ..... ,,
Siddall, Mr. W. ..... ,,
Siddall, Mr. Charles Kingsley.... ,,
Siddall, Mr. T. A. ..... ,,
Sill, Mr. T. S. .....Newry Lodge, Hoole road
Simon, Mr. John .....4 Eastgate row
Simon, Mrs. ..... ,, ,,
Simpson, Mr. Ricardo .....Newton bank
*Simpson, Mr. Frank.....10 Grosvenor street
*Skeat, Miss E. G., D.Sc.....The Queen's School
Skeldon, Mr. J..... 20 West Lorne street
Skelton, Mr. J. M. ..... 4 Ash grove, Wrexham road
Skelton, Mrs. ..... ,, ,,

Skipwith, Mr. Francis, J.P.....9 Eversley park
Smith, Mr. Cecil P. .....Newton Hall, Chester
Smith, Miss H. .....3 Abbey green
Smith, Mr. T. .....9 White friars
Smith, Mr. Emanuel L. .....14 St. Werburgh street
Smith, Mr. R. Cathcart .....The Old Hall, Guilden Sutton
Smith, Mrs. ..... " "
Sparling, Rev. W., M.A. .....Upton Vicarage, Chester
Spencer, Mrs. .....4 Waterloo road
Spencer, Miss Annie.....50 Eastgate row
Sprunt, Mrs. .....Beaconsfield School, Weston, Runcorn
Spurling, Rev. Canon F. W., M.A...9 King street
Stephen, Mrs. Peter.....Crosslooms, Mollington
Stevens. Mr. T. .....14 Eastgate row
Stewart, Mrs.....13 Stanley place
Stewart, Rev. William, B.A.....4 Eaton road
*Stirling, Mr. James .....Lorne Lodge, Campbell road, Southsea
*Stolterfoth, Dr., M.A., J.P. ....1 Grey friars
Stolterfoth, Mrs. ..... "
Stone, Miss E. M.....Holly Bank, Cambrian view
Storr, Mr. F. .....19 The Groves
Storr, Miss..... "
Storrar, Mr. Andrew .....Bryntirion, Chichester street
Stowe, Mr. F. .... .....The Grosvenor Museum
Sturg, Mr. F. A. .....Coed Efa, Wrexham
Summers, Mrs. .....Bache Hall
Stubbs, Mr. E. .....Bache Hall Gardens

Tait, Miss Daisy.. .....c/o Miss Webster, 2 Nicholas street
Tasker, Mr. W. .....Moulson House, Hoole road
Tasker, Mrs. ..... " "
Taylor, Mr. J., F.R.C.S., J.P. ..Haygarth House, 28, Nicholas street
Taylor, Miss ..... " "
Taylor, Dr. J. G., M.A. .....35 Nicholas street
Taylor, Mr. A. G.....6A Woodsome road, Highgate road, London, N.W.
Teaves, Miss .....7 Grosvenor street
Thomas, Dr. E. J. Haynes .....18 Pepper street
Thomas, Miss ..... "
Thomas, Miss Constance ..... "
Thomas, Miss F. M..... "
Thomas, Mr. Maurice .....41 Halkyn road, Hoole
Thomas, Mr. E. H. .....The Industrial Schools, Boughton
Thomas, Mr. W. C. .... .....56 Northgate street
Thomas, Mr. H. F. ..... ....Roseville, Hamilton street, Hoole
Thomas, Mrs. ..... ..... " " "
Thomas, Mr. A. E., B.A., M.B. ..Medical Officer of Health, Forest House
*Thompson, Mr. Joseph.....20 South View, Sealand road
Thompson, Mr. Edward P. .....Paulsmoss, Whitchurch, Salop
Thompson, Miss Ethel ..... .19 Cheyney road
Thomson, Miss I. .....9 Cambrian View
Thomson, Mr. J. R., J.P. .....Uffington House
Thomson, Mrs. ..... " "
Thornthwaite, Mr. Noel ..... c/o Mrs. Hincks, Brantwood, Brook lane
Thornthwaite, Miss E. M. ..... " " "
Thornthwaite, Miss H. L. ..... " " "
Tilston, Miss ..... ....Harlestone, Newton lane
Tobias, Mr. John .....Crypt chambers, Eastgate row
Tomkinson, Mr. Jas., M.P. .....Willington Hall, Chester
Townshend, Mr. C. W., J.P. ....Charlton Kings, Cheltenham
Trevor, Mr. Warren .....Redlands House, Hough green

Tullock, Mr. W. ..... 1 Dale street, Tarvin road
Tupling, Mr. C. ..... Wirral House School, 4 The Bars
Turner, Mr. Frank, A.C.P. ..... Eccleston School House
Tyson, Miss Alice ..... 9 Frodsham street

Venables, Mr. W. H. ..... 100 Faulkner street, Hoole
Vernon, Mr. W. ..... 57 Upper Northgate street
Viggars, Mr. Charles H. ..... Watergate street

Wakefield, Mr. Robert ..... The Gardens, Leighton, Parkgate
*Walker, Mr. A. O., F.L.S., J.P. .. Ulcombe place, near Maidstone
Walker, Mrs. ..... " "
Walker, Mr. Ernest ..... 8 Sibell street
Walker, Mr. John Stringer ..... 2 Abbey green
Walker, Miss Kate ..... 4 Grey friars
Waller, Rev. A. H., M.A. ..... 6 Grey friars
Walley, Mrs. ..... Lyncroft, Raymond street
Walley, Mr. F. ..... 6 Abbey square
Walpole, Mr. John E. .. ..... Holly Bank, Upton park
Ward, Miss ..... Derby House, Hoole road
Ward, Mr. R. P. ..... 4 Hough green
Ward, Mrs. ..... " "
Ward, Mr. J. ..... Kirk Ella, Lime Grove, Hoole
Warmsley, Mr. F. J. ..... Abbot's Holme, 69 Liverpool road
Warmsley, Mrs. ..... " "
Warmsley, Miss ..... West Leigh, Hamilton street, Hoole
Warmsley, Miss L. ..... " " "
Way, Mr. N. A. E. ..... Bradpole, 57 Liverpool road
Weaver, Mr. John ..... Fern Cottage, Christleton
*Webster, Mr. G. Watmough, F.C.S., F.R.P.S. ..... Grange road, West Kirby
Webster, Mr. L. F. ..... c/o Mrs. Williams, 15 Cheyney road
Webster, Miss Amy B. ..... 2 Nicholas street
Webster, Mrs. M. S. ..... 14 St. John's road, Queen's park
Weldon, Mr. T. T. ..... 16 Queen's road
Wells, Mr. E. ..... Eccleston, Chester
Welsby, Mr. Walter .. ..... Bosville, 25 Liverpool road
Welsby, Mrs. ..... " "
*Welsh, Mr. John, M.R.C.S., L.R.C.P., F.C.S. .. 43 Tarvin road
Welsh, Mrs. Wm. ..... 34 Tarvin road
Westminster, His Grace The Duke of .. Eaton, Chester
Westminster, Her Grace The Duchess of " "
Westminster, Her Grace Katherine Duchess of .. Combermere Abbey, Whitchurch (Salop)
Whalley, Mr. Percy ..... Ashfield, Cambrian view
Whalley, Mrs. ..... " "
Whalley, Miss ..... " "
*Whichello, Mr. H., L.R.C P., M.R.C.S. .. The Mount, Tattenhall, Chester
Whitworth, Mr. Samuel ..... 39 Tarvin road
Wigg, Mr. Walter J. ..... The Firs, Newton
Wilkinson, Miss M. ..... 51 Granville road
Williams, Mr. John ..... Blue Bell bank, Saltney
Williams, Mr. R. J. ..... 8 Eaton road
Williams, Miss Aldersey ..... 100 Watergate flags
Williams, Mr. James ..... 24 Hough green
Williams, Miss Carrie ..... " "
Williams, Mr. A. T. ..... 15 Cheyney road
Williams, Mr. W. ..... The Croft. Flookersbrook
Williams, Miss Pattie ..... 51 Parkgate road
Williams, Mr. R. G. ..... Abbey Chambers, St. Werburgh street

Williams, Mr. W. Heathcote....Watford House, Victoria road
Williams, Mrs. ..... „ „
Williams, Mr. W. R., M.A. ....Rylease, Stocks lane
Williams, Mr. Geo. .....12 Filkin's lane, Tarvin road
Williams, Miss .....4 Alma street, Boughton
Williams, Mr. J. .....27 Halkyn road
Williams, Mrs. James .. .....Highfield, 25 Granville road
Williams, Miss Florence J. .....10 Spring Gardens, Flookersbrook
Williams, Dr. Trevor .....31 Nicholas street
Williamson, Mr. A. J., B.A. Cantab..7 Brookside Villas, Hoole road
Williamson, Mr. Thomas.....Cuppin street
Wiseman, Mr. H. .....Avon Royd, Hoole road
Withers, Miss M. P... .....7 Bridge place
Withers, Miss C. ..... „ „
Wolfenden, Mr. A. .....21 Hough green
Wolfenden, Miss Marion ..... „ „
Wood, Mr. T. H .....8 Hough green
Wood, Mrs. A. .....Fernleigh, Weaverham, near Northwich
Wood, Miss .....4 Waterloo road
Woodroffe, Mr. Frank K. .....18 Vicarage road, Hoole
Woodroffe, Mrs. ..... „ „
Wright, Rev. Harold H., M.A...Precentory, Abbey street
Wright, Mrs. ..... „ „
Wright, Dr. R. B. .....Folliott House, 55 Northgate street
Wright, Mrs. ..... „ „ „
Wyld, Mr. Norman .....11 City Walls
Wyld, Mrs. ..... „
*Wynne, Mr. Geo. F. .....Plas Gwyn, Minera, Wrexham
Wynne, Mr. J. H. .....49 Tarvin road
Wynne, Mrs. ..... „ „
Wynne, Mr. Geo. R. ..... „ „
Wynne, Mr. John .....Elm Bank, Rowton, Chester

## LIST OF JUNIOR MEMBERS

*(Under Rule 6).*

Anderson, Percy .....26 Hamilton street, Hoole
Atkin, Horace .....York Villa, Hamilton street, Hoole
Atkin, Miss Cecilia ..... „ „ „

Bairstow, Eric John .....Burley, Queen's park
Baker, John .....29 Gladstone avenue
Baker, Miss Ella ..... „ „
Barber, John Lawrence .....4 Kilmorey road
Barber, Miss May ..... „ „
Belton, F. W. J. .....Craigside, Sandy lane
Bennett, Miss M. Cecil .....Addiscombe, Hough green
Bleckly, Herbert .....Tentry Heys, Queen's park
Burges, R. O. .....Whitford, 11 Panton road, Hoole
Burton, Clifford E. .....The Limes, Weaverham, near Northwich

Clough, Miss Judith A. .....78 Hough green
Croston, Miss Emily.....Holmesdale, Brook lane
Curlett, Alec .....The Mount, Queen's park
Curlett, Miss Kathleen..... „ „

Day, Miss Gladys ..... .....Bryntirion, Chichester street
Delany, Miss ..... .....7 Lorne street (South)
Dickinson, Kenneth S. .....1 Upton View, Hoole
Dufton, John T. .....20 Brook lane
Dufton, Arthur Felix ..... „ „

Ellis, Arthur .....Mosslea, 3 Chester street, Saltney
Evans, Alan .....27 Hough green

Fennah, Miss Elsie .....Watergate row
Foster, Roe .....Roade Villa, Upton park
Francis, Miss ..... South Bank, Glan Aber park
Frost, Miss Linda .....Mollington Hall

Harris, Stafford Berkeley.....Dyreham, Wrexham road
Holmes, Miss Ruth .....Ashcroft, 27A Hough green
Humphry-Williams, Lionel E. ..St. Mary's Mount, Flint
Humphry-Williams, Miss Marjorie „ „

Jones, Raymond ..... .....Cliveden, Hough green
Jones, J. H. Stanley.....Glenhurst, Hoole road
Jones, Miss Annie.....28 Cambrian road

Kind, R. Gordon .....Stoneby Drive, New Brighton
King, Wilfrid Lyle .....26 Nicholas street
Kirkland, Arthur .....c/o Mrs. Kenyon, Flookersbrook

McKinlay, Miss Jeanie.....31 Cheyney road
Mann, Francis Alfred Wharton ..18 Newgate street
Mann, Geoffrey Howard ..... „ „
Matthews, Miss F. .....5 Parkgate road
Miln, Thos. Edward.....Milnholme, Brook lane
Miln, G. Gordon ..... „ „
Miln, J. Douglas ..... „ „

Newstead, John Howard.....65 Witcombe Villa, Handbridge

Parker, Wyndham .....14 Eaton road

Siddall, Frank .....23 Eaton road
Siddall, Miss Amy M. ..... „ „
Simpson, Frank Burton .....10 Grosvenor street
Summers, Miss Dorothy .....Bache Hall
Summers, Miss Phyllis..... „

Trery, C. H. .....Alvanley Vicarage, nr. Warrington

Webster, Miss .....14 St. John's road, Queen's park
Williamson, Miss Annie .....Cuppin street
Wynne, John Norman.....49 Tarvin road

PRESENTED
5 SEP. 1907

BRITISH MUSEUM
NATURAL HISTORY

CHESTER:
Printed by G. R. Griffith, "The Castle" Printing Works.

MDCCCCVII.

# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY 1871).

BRITISH MUSEUM
NATURAL HISTORY

## THIRTY-SEVENTH

# ANNUAL REPORT

INCLUDING

## STATEMENT OF ACCOUNTS, &c.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Ten Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any candidate for membership of the Society, with those of a proposer and a seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That Junior Candidates between the ages of 12 and 21 shall be admitted, at a subscription of 2/6 per annum, to all the privileges of the Society, excepting that of voting.

7.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed Thirty.

8.—A Member may introduce one friend at any of the Sectional Meetings The Chairman and Secretary of each Section, may, on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each —except to the Annual General Meeting, to which Members only are admitted.

9.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

10.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

11.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

12.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

13.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the Members of the Committee present shall decide whether such meetings be postponed or not.

14.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

15.—That the Annual General Meeting of the Society shall be held in the month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement made up to the end of April, and duly audited, shall also be submitted, and read if desired.

16.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

17.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

18.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

19.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1908-1909.

## President:

DR. A. HAMILTON, J.P.

## Vice-Presidents:

PROF. T. McKENNY HUGHES, F.R.S.
A. O. WALKER, ESQ., J.P., F.L.S.
W. M. DOBIE, ESQ., M.D., J.P., F.R.A.S.
T. SHEPHEARD, ESQ., F.R.M.S.
G. R. GRIFFITH, ESQ., J.P.
J. D. SIDDALL, ESQ.
REV. A. H. FISH, B.A., B.Sc.
F. W. LONGBOTTOM, ESQ., F.R A.S.

## Officers of Sections:

### BOTANICAL

CHAIRMAN—MR. J. D. SIDDALL ... ... ... ... 23, *Eaton Road*
SECRETARY—MR. A. E. GOODMAN ... ... ... *Oakdene, Tarvin Road*

### ZOOLOGICAL.

CHAIRMAN—DR. W. HENRY DOBIE ... ... ... 2, *Hunter Street*
SECRETARY—MR. W. F. J. SHEPHEARD, F.C.S. ... *Bridge Street Row*

### GEOLOGICAL.

CHAIRMAN—MR. A. W. LUCAS, F.G.S.... ... ... 4, *St. John's Road, Queen's Park*
SECRETARY—MR. EGERTON GILBERT ... ... ... 21, *Eaton Road*

### NATURAL PHILOSOPHY.

CHAIRMAN—MR. G. WATMOUGH WEBSTER, F.C S. *Grange Road, West Kirby*
SECRETARY—MR. J. BAIRSTOW, F.C.S. .. ... ... *Burley, Queen's Park*

### MICROSCOPICAL.

CHAIRMAN—DR. J. ELLIOTT, B.Sc. ... ... ... 24, *Nicholas Street*
SECRETARY—MR. J. D. SIDDALL ... ... ... 23, *Eaton Road*

### PHOTOGRAPHIC.

CHAIRMAN—MR. J. A. McMICHAEL, B.A., B.Sc. ... 39, *Parkgate Road*
SECRETARY—MR. FRANK SIMPSON ... .. ... 10, *Grosvenor Street*

### LITERATURE.

CHAIRMAN—REV. A. H. FISH, B.A., B.Sc. ... ... *Abbot's Villas*, 45, *Liverpool Road*
SECRETARY—DR. J. T. ROBERTS ... ... ... ... *Montana House*, 127, *Boughton*

### ASTRONOMICAL.

CHAIRMAN—DR. W. M. DOBIE, F.R.A.S. ... ... *Kirkton House*, 4, *Hunter Street*
SECRETARY—MR. F. W. LONGBOTTOM, F.R.A.S ... *Haselmere, Queen's Park*

### ART.

CHAIRMAN—THE VERY REV. DR. DARBY ... ... ... *The Deanery*
SECRETARY—MR. HORACE DAVIES ... ... ... 14, *Newgate Street*

## Hon. Treasurer:

MR. JOHN SIMON, 4, *Eastgate Row*

## Hon. Secretaries:

*Scientific*—REV. A. H. FISH, B.A., B.Sc. *Abbot's Villas*, 45, *Liverpool Road*
*General*—MR. G. P. MILN, *Milnholme, Brook Lane*
*General*—MR. FRANK SIMPSON, 10, *Grosvenor Street*

## Hon. Librarian:

MR. ALFRED NEWSTEAD, *The Grosvenor Museum*

## Committee:

THE ABOVE OFFICERS *(Ex-officio)*
AND

MISS BEATRICE CLAY, B.A.
MISS E. G. SKEAT, D.Sc.
REV. J. L. BEDFORD, M.A., F.L.S.
MR. J. DAY
MR. J. LYON DENSON
DR. GRANGER
DR. RANDELL JACKSON, M.Sc.
DR. KING
MR. A. E. LOVELL, M.A.
MR. R. NEWSTEAD, A.L.S., F.E.S
MR. P. H. OKELL
DR. JAMES TAYLOR

## Hon. Auditors:

MR. BERESFORD ADAMS
MR. E. NOEL HUMPHREYS, F.C.A.

## Curator:

MR. ALFRED NEWSTEAD, *The Grosvenor Museum.*

## Assistant Secretary:

MR. W. J. NEW

## Representatives of the Society upon the Grosvenor Museum Management Committee:

MR. J. BAIRSTOW, F.C.S. MR. F. W. LONGBOTTOM, F.R.A.S. MR. J. D. SIDDALL
DR. A. HAMILTON, J.P. MR. G. P. MILN MR. JOHN SIMON

## THIRTY-SEVENTH

# ANNUAL REPORT.

In presenting this Report, your Committee are glad to be able to congratulate the Members on the maintenance of the high standard of success and prosperity which has been reached in the previous year.

During the Summer months Excursions and Field Meetings were held as follows:—

## EXCURSIONS AND FIELD MEETINGS.

1907.

May 22nd—The Coombes, Broxton.
(By kind permission of George Barbour, Esq., J.P.)

„ 29th—The Lache Eyes, returning by the Lache Lane.

June 5th—Evening Meeting at the Grosvenor Museum, to inspect the Collections of British Plants in bloom, collected by the Curator and Junior Members, as well as the Society's Zoological, Entomological, and Geological Collections.

„ 12th—Mollington Hall for the Lake, Woods, and Gardens.
(By kind invitation of Mr. & Mrs. T. Gibbons Frost).

„ 19th—Burton Point, for Burton Rocks and the River Marshes.

„ 26th—Blacon and Saughall.

July 3rd—Annual Excursion to Rhydymwyn, for Moel Fammau, The Leete, and The Loggerheads.

„ 10th—Navigation Cop, Ferry Lane, and Sealand Marsh.

„ 31st—Heron Bridge Meadows.

Sept. 11th—Brymbo Steel and Ingot Iron Works, near Wrexham.
(By kind permission of The Brymbo Steel Co., Ltd.)

An Excursion, arranged to take place on July 24th, to Tryddyn Lodge Colliery, *via* Mold (by kind permission of The Welsh Coal and Cannel Company, Limited), was abandoned on account of an insufficient number of interested members to make up a party.

The attendance at the General and Sectional Meetings has been, throughout, satisfactory; and an increasing interest is being shewn in more than one branch of Natural History.

The following is a complete list of the General and Sectional Meetings held during the past Autumn and Winter Session :—

## GENERAL MEETINGS.

1907.

Oct. 2nd—Annual Conversazione in the Town Hall.

,, 10th—"Glimpses of the Brontës"—MRS. A. HORSFALL PERRY.
Fully illustrated with Lantern Slides.

,, 24th—"Local Fungi," when and where found—MR. JOSEPH THOMPSON
Illustrated by numerous Lantern Slides and fresh-gathered Specimens.

,, 31st—Evening Meeting at the Grosvenor Museum to inspect the Society's Collections of Natural History, which were described by MR ROBERT NEWSTEAD, MR. A. W. LUCAS, MR. J. ARKLE, MR J. THOMPSON, MR. F. SIMPSON, and the CURATOR (MR. ALFRED NEWSTEAD).

Nov. 7th—"Springtime in the Undercliff District of the Isle of Wight."—MR. J. D. SIDDALL.
Illustrated by Photographs of the Scenery, Botany, and Geology,

Dec. 5th—"The Common House-Fly"—MR. R. NEWSTEAD, A.L S., F.E.S., Hon. F.R.H.S. (Lecturer in Economic Entomology and Parasitology, The Liverpool School of Tropical Medicine, University of Liverpool).
Illustrated by Lantern Slides and Specimens bred from refuse of various kinds.

1908.

Jan. 9th—"The River Mersey from the Moors to the Sea"—DR. J. W. ELLIS, F.E.S. (Hon. Secretary Liverpool Naturalists' Field Club).
Illustrated by upwards of 120 Lantern Slides of Photographs specially taken by the Lecturer.

Feb. 6th—"Colour Photography"—MR. HENRY J. COMLEY, F.R.P.S. (Hon. Secretary of the Society of Colour Photographers).
Illustrated by Lantern Slides.

Mar. 12th—General Meeting (under the auspices of the Section of Arts and Crafts). "Rossetti and his influence on Art"—MR. E. RIMBAULT DIBDIN (Curator of the Walker Art Gallery, Liverpool).
Fully illustrated by Lantern Slides.

,, 19th—"Travels in China, 1900 to 1907"—MR. ALEXANDER REID, M. Inst. C.E., M E., F G.S.
Illustrated by upwards of 100 Lantern Slides from Photographs taken by the Lecturer.

April 2nd—"A day with the Society on their Annual Excursion of 1907"—MR. FRANK SIMPSON.
Illustrated by about fifty Lantern Slides; and a model of the district made in the City and County School for Boys.

1907.

Dec. 2nd to 9th—Exhibition of the Kingsley Memorial Nature-Study Prize Competitions in the Art Gallery.

# SECTIONAL MEETINGS.

## BOTANICAL SECTION.

1908.

Feb. 13th—"Field Photography" (chiefly Flowers and Fungi)—
DR. C. THEODORE GREEN, F.L.S., &c.
Illustrated by about 130 Lantern Slides by the Lecturer.

## ZOOLOGICAL SECTION.

1907.

Oct. 17th—"British Beetles"—MR. G. A. DUNLOP (Assistant Curator Warrington Municipal Museum).
Illustrated by Coloured Lantern Slides.

1908.

Feb. 20th—"Zoological Notes and Observations on the Past Year," contributed by the following Members:—THE CHAIRMAN, MR. J. ARKLE, MR. SIDNEY G. CUMMINGS, DR. JACKSON, MR. R. NEWSTEAD, MR. C. K SIDDALL, MR. J. THOMPSON, THE CURATOR (MR. A. NEWSTEAD), and others.
Several of the contributions were illustrated by Lantern Slides.

Occurrence of the Bottle-nosed Whale at Mostyn (illustrated), by THE CURATOR (MR. A. NEWSTEAD).

## GEOLOGICAL SECTION.

1907.

Dec. 19th—"Deserts"—MR. J. LOMAS, A.R.C.S., F.G.S.

## NATURAL PHILOSOPHY SECTION.

Nov. 21st—"Stereo-Chemistry and Vitalism"—MR. R. CECIL OWEN, B.Sc. (in the place of MR. D. TREVOR JONES, M.Sc.)
Illustrated by Models and Diagrams.

1908.

Feb. 27th "Electrical Power" (Generation, Distribution, and Application)—MR. GEO. E. SWIFT (of the Chester Corporation Electricity Works).

## MICROSCOPICAL SECTION.

1907.

Dec. 12th—Special Microscopical Evening. All Members interested in Microscopic work were specially invited to be present to elect Officers of the Section, when DR. ELLIOTT was elected Chairman, and MR. J. D. SIDDALL Secretary.

An Exhibition of a series of Microscopical objects was afterwards given.

1908.

Jan. 16th—"A Demonstration of Micro-Photography by the new Lumiere Colour Process"—DR. ELLIOTT, B.Sc.

April 9th—"Some new 'Lumiere' Micro-Photographs"—
DR. ELLIOTT, B.Sc.

"Notes on Diatomaceæ" (with special reference to the Stolterfoth Collections of Slides, Material, and Literature)—
MR. J. D. SIDDALL.

## PHOTOGRAPHIC SECTION.

1907.
Oct. 25th—"Lantern Slide making by Contact and Reduction"—
MR. FRANK SIMPSON.

Nov. 15th—"In South Africa with the British Association"—
MR. SAML. OKELL, F.R.A.S. (Bowdon).
Illustrated with 150 Lantern Views.

" 22nd—"Prints, and how to Mount them." "Mountants," &c.—
MR. FRANK SIMPSON.

Dec. 20th—A General Meeting of the Members was held to elect a Chairman of the Section in place of the late DR. STOLTERFOTH, when MR. J. A. MCMICHAEL, B.A., B.SC., was elected Chairman.

1908.
Jan. 15th—"Discussion on Time Development," opened by
MR. W. ERNEST BROWN.

" 30th—Exhibition of the Affiliation of Photographic Societies' 1907 Prize Lantern Slides, with descriptive notes—
MR. FRANK SIMPSON.

Feb. 14th—"Toning Bromide Enlargements," with practical demonstration—
MR. P. H. OKELL.

April 10th—"The Making of Enlarged Negatives"—
MR. W. ERNEST BROWN.

## LITERATURE SECTION.

1908.
Jan. 23rd—"The Beowulf"—REV. EDMUND DALE, D.LITT., M.A.

Mar. 26th—"The Youth of Milton"—MR. CHAS. TUPLING.
Illustrated by about 50 Lantern Slides.

## ASTRONOMICAL SECTION.

1907.
Nov. 28th—"Comets and Meteors"—
MR. SAML. FELLOWS, F.R.A.S. (of Wolverhampton).
Illustrated by numerous recent Slides.

1908.
Mar. 5th—"Two new Telescopes and some of their Work"—
MR. J. H. REYNOLDS, F.R.A.S. (of Birmingham).
Illustrated with some unique Lantern Slides.

## MICROSCOPICAL SECTION.

The revival of the Microscopical Section of the Society—once its most flourishing department, but latterly cast into the shade by other developments—has been a distinct gain. Under the able Chairmanship of Dr. Elliott, with Mr. J. D. Siddall as Secretary, an excellent beginning has been made. Several former workers have signified their intention of attending and helping at the Meetings; and the Committee hope the Section will soon regain its former vigour.

## FIELD EXCURSIONS.

The Committee would be glad to see a larger number of members avail themselves of the Summer Excursions.

These usually involve a good deal of trouble on the part of the Society's Officers—correspondence with Owners, arrangements with the Railway Companies, catering, sale of tickets, attendance of Officers, &c.—and it would be absurd to pretend that the trouble, though gladly given, is, even usually, repaid by the number of those who attend.

Members do not sufficiently realize that these Excursions, though not, perhaps, of much use for scientific observations, or for collecting purposes, do yet give the best possible opportunities for bringing together those who are interested in the same branches of Natural History, for the comparison of observations, and for the interchange of ideas.

## MUSEUM AND EXHIBITS.

### Junior Societies and schools.

On the other hand, your Committee is glad to notice the increasing interest which is being taken by members and non-members alike in the Society's Museum and Exhibits. This is especially noteworthy in connection with the great revival of interest among young people in Natural History, and the endeavours that are now being made to encourage Nature-Study as a regular means of education and mental training. The number of Junior Members has largely increased. It is also a pleasure to notice that at least two Secondary Schools in the City have formed their own Natural History Societies, which are working in connection with our own Society. There has been a very largely increased use of the Museum by the children of the Elementary Schools and their teachers; at the request of the Local Education Authority, loan collections have been arranged and circulated, and lectures are regularly given to children by the Curator. The competition for the Kingsley Junior Prizes produced more candidates and better work than in previous years. The exhibition of wild flowers named and classified, which was so successful last year, is being carried on again this year. Independently of its general interest, it has proved very useful as a means

of enabling beginners in Botany to verify the names of plants, grasses, and ferns.

In these and other ways the work done in the past by the pioneers of the Society is bearing its fruit.

Of one of these the Society has this year to deplore the irreparable loss, the late Dr. Henry Stolterfoth, one of the original members of the Society, a friend of its founder, for many years its able Scientific Secretary, a Kingsley Medallist, and Past-President, whose zeal and interest remained unabated to the last.

His death inflicts upon the Society the severest personal loss it has as yet sustained. An enthusiastic and successful worker in his own department of Science, a wise counsellor, a staunch and sympathetic friend, he gave us unceasingly and ungrudgingly, and with a rare simplicity and sincerity, his ripe experience, his well-earned leisure, and best of all, his unfailing and genial courtesy.

Your Committee have thought it fitting to record, on another page, in the form of an Obituary Notice, the feelings with which, they feel sure, the whole Society regards his loss (accompanying which is an illustration from a photograph kindly lent by Mr. Frank Simpson).

## LEGACIES.

The Society has received, during the past year, two legacies—one from the late Dr. Stolterfoth; the other from the late John Eyton Williams.

The first consists of the valuable Microscope, Telescope, Microscopic Slides and Material, and Scientific Books of the late Dr. Stolterfoth. These are now in the Museum and will shortly be available for use by members.

The other is a bequest of £250, received through Dr. James Taylor, one of the oldest members, and the Executor of the late Mr. Williams. It is left to the Society without conditions. The Committee have still under consideration the use to which this sum shall be put. The suggestion which has hitherto received the most favour is that the Interest be used for an annual lecture on some scientific subject of general interest to be called, In Memoriam—"The John Eyton Williams Lecture."

## TRANSFER TO THE COUNCIL.

The negotiations which have for their object the transfer of the Grosvenor Museum building to the City are now nearly complete. The Society's property in Collections, Furniture, Books, and Scientific Instruments, as well as its rights-of-user in the building are fully secured, under a Scheme of the Charity Commissioners. The Society will continue to pay to the Council an annual sum towards the maintenance of the Institution, and will have two representatives on the body which will manage the Building. The present Day-Schools will be eventually removed; and we may hope that some of the space thus gained will be allotted to Museum purposes, for which additional room is very much needed.

The membership of the Society is as follows:—

| | |
|---|---|
| Honorary Members .. .. | 26 |
| Corresponding ,, .. .. | 28 |
| Ordinary ,, .. .. | 910 |
| Junior ,, .. .. | 78 |
| Total .. .. .. | 1,042 |

Your Committee have met 15 times during the past year for the transaction of business, and the attendance at these Meetings has been above the average of recent years.

A. H. FISH, B.A., B.Sc.,
*Hon. Scientific Secretary.*

G. P. MILN,
F. SIMPSON, } *Hon. Gen. Secretaries.*

GROSVENOR MUSEUM,
MAY 21st, 1908.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1908.

**Dr.**

| | £ s. d. | £ s. d. |
|---|---|---|
| By Balance from last year ... ... ... ... | | 1 6 2 |
| ,, 874 Subscriptions for year 1907-8 at 5/- ... ... | 218 10 0 | |
| ,, 19 Arrears ,, 1906-7 at 5/- ... ... | 4 15 0 | |
| ,, 3 ,, ,, 1905-6 at 5/- ... ... | 0 15 0 | |
| | | 224 0 0 |
| ,, 71 Junior Subscriptions for year 1907-8 at 2/6 ... | | 8 17 6 |
| Subscriptions unpaid— | | |
| 38 for 1907-8 at 5/- ... ... | £9 10 0 | |
| 5 Juniors for 1907-8 at 2/6 ... ... | 0 12 6 | |
| ,, Gross Receipts from Excursions— | | |
| The Coombes, Broxton ... ... ... | 5 0 3 | |
| Mollington Hall ... ... ... ... | 2 14 9 | |
| Burton Point ... ... ... ... | 0 11 7 | |
| Rhydymwyn, &c., (Annual Excursion)... ... | 8 2 6 | |
| Brymbo, near Wrexham ... ... ... | 5 2 3 | |
| | | 21 11 4 |
| ,, Gross Receipts from Conversazione ... ... | | 11 1 8 |
| ,, ,, ,, Lectures and Sectional Meetings | | 2 11 0 |
| ,, Sales of Society's Publications ... ... ... | | 0 13 6 |
| | | 270 1 2 |
| Debit Balance ... ... | | 20 13 11 |
| | | £290 15 1 |

**Cr.**

| | £ s. d. | £ s. d. |
|---|---|---|
| To Museum Management Committee ... ... ... | | 75 0 0 |
| ,, Natural History Museum and Library ... ... | | 29 1 3 |
| ,, Postages ... ... ... ... ... | | 36 18 10 |
| ,, Printing, Stationery, and Advertising ... ... | | 66 10 9 |
| ,, Expenses in connection with Excursions— | | |
| The Coombes, Broxton ... ... ... | 2 17 0 | |
| Mollington Hall ... ... ... ... | 2 16 0 | |
| Burton Point... ... ... ... | 1 9 6 | |
| Rhydymwyn, &c., (Annual Excursion) ... | 7 5 6 | |
| Brymbo, near Wrexham ... ... ... | 4 12 3 | |
| | | 19 0 3 |
| ,, Lectures, Evening Meetings, &c.— | | |
| Conversazione ... ... ... ... | | 22 14 0 |
| Fees to Lecturers ... ... ... ... | | 10 10 0 |
| ,, Salary to Assistant Secretary ... ... ... | | 15 0 0 |
| ,, Subscriptions— | | |
| Ray Society ... ... ... ... ... | 1 1 0 | |
| Royal Photographic Society ... ... ... | 1 1 0 | |
| Palæontographical Society ... ... ... | 1 1 0 | |
| | | 3 3 0 |
| ,, Lantern Account ... ... ... ... | | 10 15 0 |
| ,, Collecting outstanding Subscriptions ... ... | | 2 2 0 |
| | | £290 15 1 |

Examined with the Accounts and Vouchers relating thereto and found to be correct, showing a balance due to the Hon. Treasurer of £20 13s. 11d.

CHESTER, 12TH MAY, 1908,

JOHN SIMON, HON. TREASURER.

BERESFORD ADAMS,
E. NOEL HUMPHREYS, F.C.A. } HON. AUDITORS.

# In Memoriam.

## Henry Stolterfoth, M.A., M.D., J.P.,

Born 26th September, 1836; Died 6th October, 1907.

Kingsley Memorial Medallist 1886.

President 1895 to 1897.

One of the Founders, and for 36 years the
Honorary Scientific Secretary
of the Society,
whose Members
Mourn the Loss and Cherish the Memory
of one whose
Life was freely given
to
the Study of Nature,
the Advancement of Science,
and the
Service of his Fellow-Men.

Henry Stolterfoth, M.A., M.D., J.P.

Born 26th September, 1836; Died 6th October, 1907.

BRITISH MUSEUM
NATURAL HISTORY

# CURATOR AND LIBRARIAN'S REPORT.

YOUR Curator is pleased to record the sustained interest in the Society's Museum during the past year, evidenced by many new and rare additions.

A specimen of the Lesser Shrew *(Sorex pygmæus)*, presented by MR. T. A. COWARD, is worthy of special mention, being not only new to the Society's collections, but, according to existing records, an exceedingly uncommon species in Cheshire and North Wales. It is also of interest to add that the Lesser Shrew is nowhere so abundant as the Common Shrew *(Sorex vulgaris)*, and is the smallest British Mammal.

MRS PARK YATES, of Ince Hall, near Chester, has presented a very fine male Black Grouse *(Tetrao tetrix)*, shot on the Ince estate in November or December of 1885. As a local specimen this is an important and valuable addition.

A specimen of the Eared-Grebe *(Podiceps nigricollis)* is worthy of note.

MESSRS. J. R. LE B. TOMLIN, G. ARNOLD, J. ARKLE, R. NEWSTEAD, and your CURATOR, have added many new and interesting species to the Insecta.

A new Life-History Group of the Green Woodpecker *(Gecinus viridis)* has been prepared and mounted by your Curator from material collected at Broxton, Delamere Forest, and North Wales. The nest (containing five eggs) is composed of the actual pieces of wood hewn by the parent birds from inside of the birch-tree trunk. The female adult bird is presented by MR. C. CRUM.

It will be seen, on referring to the list, that 416 specimens have been added to the collections, representing 299 species.

The Local Education Authorities, in conjunction with the Museum Management Committee, have arranged for a third course of "Nature Study" Lectures to be given by your Curator to children selected from the higher forms of the Elementary Schools The first lesson was given on April 6th, 1908, and the remaining lessons will be continued over a period of eighteen weeks. Below is a list of the subjects chosen :—

(1) The Common House-Fly
(2) The Redbreast and Nightingale
(3) Sea Gulls of the Dee
(4) Mice, Voles, and Shrews
(5) Extinct Mammals of Britain (The Mammoth, Rhinoceros, and the Cave Bear)
(6) Familiar Wild Flowers.

The number of children attending each lesson averages from thirty to forty. Boys attending on Monday afternoon, and the Girls on Thursday in each week, respectively. The total number of attendances, at an average weekly attendance of seventy, is 1,260. Specimens selected from the Society's collections; and living specimens whenever it is possible and practicable to procure them; also lantern photographs, are used to illustrate the lessons.

## ADDITIONS TO THE SOCIETY'S MUSEUM.

MR J. ARKLE—2 species and 13 specimens of *Lepidoptera.*

MR. G. ARNOLD—3 species and 6 specimens of *Hymenoptera.*

MISSES ROSE AND ETHEL ASHTON—Nest of Squirrel.

MRS. CHAMBERS—Grass Snake *(Tropidonotus natrix).*

COL. BRYAN G. DAVIES COOKE—Series of *Chermes corticalis (Aphidæ).*

MR. T. A. COWARD—Lesser Shrew *(Sorex pygmæus).*

CURATOR—15 species and 29 specimens of *Lepidoptera.*

MISS GIBSON—Example of Mountain Limestone, with encrniites *in situ.*

MR. P. T. GODSAL—Ring-Ouzel *(Turdus torquatus).*

MR. F. W. HUTTON—Photograph of portion of Skull of the Wild Ox *(Bos primigenius)*, and outline drawing, with measurements; Black Rat *(Mus. Rattus).*

MR. J. H. HUTCHINGS—*Adimonia capræa.*

DR. RANDELL JACKSON—*Rhagium bifasciatum.*

MRS. KING—Collection of Marine Shells; 89 specimens.

CAPTAIN LINCOLN—Collection of 60 specimens of Ferns; not British.

MR. R. NEWSTEAD—3 species, 7 specimens of *Hymenoptera*; 1 *Xylophasia scolopacina*; clutch of 9 eggs of Coot *(Fulica atra)*; clutch of 3 eggs of Black-headed Gull *(Larus ridibundus).*

MR. ARTHUR NEWSTEAD—Immature Ruff *(Machetes pugnax)*; Eared Grebe *(Podiceps nigricollis).*

MR. CHAS. OLDHAM—2 species and 13 specimens of *Mollusca.*

MR. OXENBOULD—Large Emerald *(Geometra papilionaria).*

MR. C. W. ROGERS—*Brotolomia meticulosa.*

MR. W. F. J. SHEPHEARD—*Ophium luteum.*

MR. CHAS. KINGSLEY SIDDALL—Pochard Duck *(Fuligula ferina)*; Great Crested Grebe *(Podiceps cristatus).*

MR. J. R. LE B. TOMLIN—25 species and 42 specimens of *Coleoptera.*

MR. VERNON—Specimen of Copper Ore; and Photographs of Mine, Bickerton Hill, Cheshire.

MR. WILLIAMS—Otter *(Lutra vulgaris).*

MRS. WOOD—Collection of 200 species of Flowering Plants and Ferns collected in North Wales by the late Miss E. M. Wood, together with Diploma awarded.

MRS. PARK YATES—Male Black Grouse *(Tetrao tetrix).*

MR. YOUDE—Malformed Egg of Pheasant.

By Purchase—Immature Guillemot *(Uria troile).*

By Purchase—Sparling or Smelt *(Osmerus eperlanus).*

## ADDITIONS TO THE SOCIETY'S LIBRARY 1907-1908.

(Marked * are by exchange).

In addition to the late Dr. H. Stolterfoth's valuable bequest to the Society's Library (of which a detailed list is appended), the latter has been enriched by many other important additions.

Abhandlungen und Bericht LI. des Vereins für Naturkunde Zu Cassel über das 71 Vereinsjahr, 1907.

Africa, West Commercial possibilities of; Viscount Mountmorres, 1907. Liverpool University Quarterly Journal.

Annelids, British; Prof. W. C. McIntosh; Vol. II., Part 1, 1908, Ray Society.

Art, Principles of, 1895. Presented by the Authorities of the Ruskin Museum, Sheffield.

*Barrow Field Naturalists' Club Annual Report, Vol. XVIII., 1907.

Birmingham Natural History and Philosophical Society—List of Members, 1907; Report, 1906; Proceedings, Vol. XII., No. 1, 1907.

Bolton Museum Report, 1907.

*Bristol Naturalists' Society, Proceedings, Vol. I., Part 3, 1907.

*British Association, Report of 77th Meeting, Leicester, July-August, 1907.

*British Museum of Natural History Publications—

Guide to the Gallery of Reptilia and Amphibia, 1906.

" " Fossil Reptiles, Amphibians, and Fishes, 1905.

" an exhibition of Old Natural History Books, illustrating the origin and progress of the study of Natural History up to the time of Linnæus. 1905.

" the Great Game Mammals (Ungulata), 1907.

" the Galleries of Mammals (other than Ungulates), 1906.

Guide, General, to the British Museum of Natural History, 1906.

Books and Portraits illustrating the History of Plant Classification, 1906.

Linnæus, Memorial to, 1907.

List of British Seed-Plants and Ferns, 1907.

*Brooklyn Institute of Arts and Science—

Bulletin, Vol. I., No. 2.

"Notes on the Electrical Phenomena of the Vesuvian Eruption, April 1906."

"Notes on the Eruption of Stromboli, April-June 1907"; F. G. Perret.

"Science Bulletin," Vol. I., Nos. 1-10, 1901-1902, 1904-1907.

"List of Longicorn *Coleoptera*, collected on the Museum expeditions to Brownsville, Texas, and the Huachuca Mountains, Arizona, and species and notes on known species"; Charles Schaeffer, February 1908.

"On a second small collection of Birds from Trinidad"; G. K. Cherrie, Vol. I., Nos. 12, 13, March 1908.

*Cardiff Naturalists' Society, Transactions, Vol. XXXIX., 1907.

Cardiff Museum Report, 1907.

Chester Society of Natural Science, Literature, and Art, Proceedings, Part VI., No. 1, 1907—"Some Rare Arachnids," A. Randell Jackson; and Thirty-sixth Annual Report, 1906-1907.

Colchester, Report of Corporation Museum and Muniment Committee, 1907.

*Colorado, University Studies, Vol. V., No. 1 December 1907, Vol. V., No. 2, February 1908.

Dublin Science Museum, Report of Director, 1905-1906.

Dumball Island, Occurrence of a Shell-bearing Gravel at; H. Bolton, 1903. *Donor*, Mr. R. Newstead.

Dundee, Report of the Free Library Committee, 1906.

"Earwigs, Note on the Mating of"; Henri Gadeau de Kerville, 1907. *Donor*, Mr. E. J. Burgess Sopp.

Entomological Literature, Catalogues of, 1907. *Donor*, Dr. A. Randell Jackson.

"Entomologist," 1907. By purchase.

*"Essex Naturalist," Vol. V., Part 1. Vol. XIV., Part 8, 1907; Vol. XV., Parts 2 and 3, 1907.

Geographical Journal, Royal, 1907. By purchase.

Geographical Journal, Royal—1879-1884 (complete); 1885, January-July; 1887, April-December; 1888, January-October; 1891, January; 1892, January-September. *Donor*, Mr. A. W. Lucas.

Geological Society, Quarterly Journal—Vol. XLIV., No. 173, 1888; Vol. LXI., Nos. 241-244; Vol. LXII., No. 245, 1906; Vol. LXIII., No. 251. 1907. *Donor*, Mr. A. W. Lucas.

Geological Problems, Sundry; C. Henriksen, 1906.

*Geologists' Association, Proceedings, Vol. XX., Parts 2-5, 1907-1908.

* " " List of Members, February 1908.

Glamorganshire, Contribution to the Spider Fauna of; A. Randell Jackson, 1907. *Donor*, The Author.

Glasgow Museums and Art Galleries Report, 1907.

Hastings Corporation Museum, Curator's Report, 1907.

House-Fly, Common (*Musca domestica*, Linn.), Habits, Life-Cycle, and Breeding Places of, as observed in the City of Liverpool, with suggestions as to the best means of checking its increase. Preliminary Report, December 1906, October 1907; Robert Newstead. *Donor*, The Author.

*Hull Museum, Quarterly Record of Additions; T. Sheppard, Curator of Hull Museum, 1907.

"Knowledge," 1907. By purchase.

Lancashire. Nomenclature of the Seams of the Coal Measures; Henry Bolton, 1898. *Donor*, Mr. R. Newstead.

Lancashire. Palæontology of the Coal Measures; Henry Bolton, 1904. *Donor*, Mr. R. Newstead.

Lead and its compounds; Thomas Lambert, 1902. *Donor*, Mr. J. A. McMichael.

*Liverpool Geological Association, Proceedings, No. 2, 1907.

*Liverpool Geological Society, Proceedings, Vol. X., Part 3, 1906-7.

Liverpool Naturalists' Field Club, Proceedings, 1907. *Donor*, Dr. Ham ton.

Liverpool Observatory, Birkenhead. Report of the Director of the Observatory to the Marine Committee, 1906. *Donor*, Mr. F. W. Longbottom.

*Liverpool, Proceedings of the Literary and Philosophical Society, No. LIX., 1905-6; No. LX., 1906-7.

Liverpool Science Students' Association, 26th Annual Report, 1907.

Liverpool University, Quarterly Journal, Vol. II., No. 4, 1907; Vol. II., No. 5, 1907; Vol. III., No. 6, 1908; Index to Vol. I., Nos. 1-3, compiled by R. Newstead.

*Lloyd Library Bulletin. "Mythical Notes," 1906; "Nidulariaceæ, or Bird's-Nest Fungi," 1906; "Phalloids of Australasia," 1907; C. G. Lloyd.

London, Abstracts and Papers printed in the Philosophical Transactions of the Royal Society of, from 1800-1830, Vols. I. and II. *Donor*, Dr. W. M. Dobie.

London Entomological Society, Transactions, Parts I.-V., 1905; Parts II.-IV., 1906. *Donor*, Mr. R. Newstead.

*Manchester Field Naturalists' Society, Report and Proceedings, 1906.

Manchester Literary and Philosophical Society, Memoirs and Proceedings, Vol. LI., Parts 1-3, 1906, 1907. *Donor*, Mr. Chas. Oldham.

*Manchester Microscopical Society, Annual Report, 1907.

Manx Slates of the Isle of Man, Palæontology of; Henry Bolton, 1899. *Donor*, Mr. R. Newstead.

Memoirs of the Royal Astronomical Society, Appendix to, Vol. LVII., 1906. *Donor*, Dr. W. M. Dobie.

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## INVENTORY OF THE LATE DR. H. STOLTERFOTH'S BEQUEST.

1 Compound Microscope (Ross), with case.

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1 Small Eye-piece Camera.
1 Sextant.
18 Boxes, containing slides of microscopical objects.
2 Boxes, containing lantern slides.

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*The above-named Books have been arranged and catalogued, and are available for the use of Members of the Society.*

ALFRED NEWSTEAD,
*Curator and Librarian.*

May 21st, 1908.

# METEORIC ASTRONOMY.

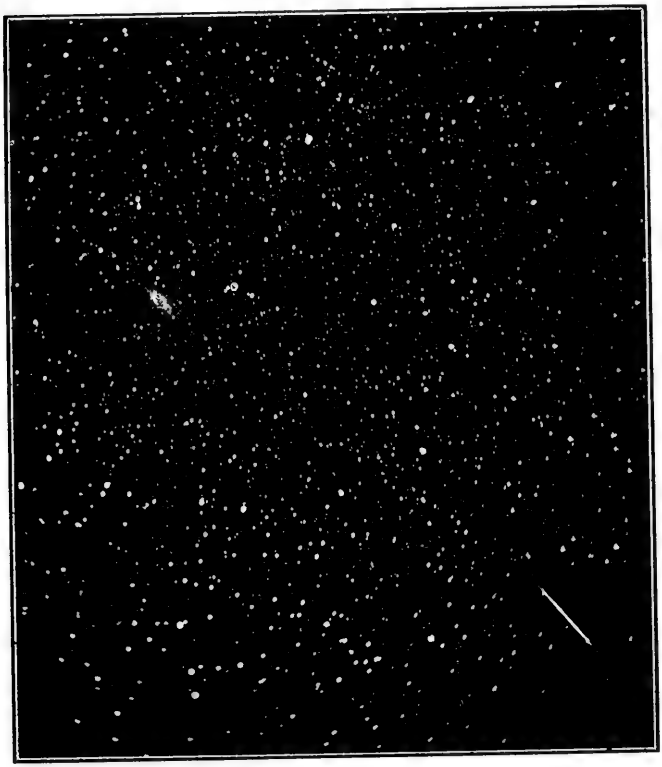
One often hears the remark that "Astronomy would be more popular if the instruments associated with it were less costly." This hindrance is frequently overcome by observers making their own equipment; but perhaps the fact that some branches of this fascinating pursuit require no outlay at all, is almost universally overlooked. As an example of a fine opening for really earnest endeavour, let us consider for a few moments the claims of Meteoric Astronomy.

Standing out in the open on any clear moonless night, one has not long to wait before witnessing one of the most impressive sights the Heavens can offer—the passing of a "Shooting Star." It is now well-known that these are dark bodies, often quite tiny, coursing round the sun in elliptical orbits; which, encountering the earth on her somewhat similar journey, dash into our atmosphere with great, though varying, velocity, and friction renders them incandescent and visible. Sometimes many of these apparitions are seen during a single evening, and a large proportion of these may seem to radiate from one point or area in the sky. If that area ("Radiant Point" it is called), lies, say, in the constellation Perseus, we should speak of the display as a shower of "Perseid Meteors" or "Perseids"; if in Leo, as "Leonids"; and so on. Many showers are known, and their arrival on definite dates can be anticipated with reasonable confidence. A close connection between Meteor showers and some well-known periodic Comets has been traced.

Foremost amongst the pioneers in this field of research, is Mr. W F. Denning, of Bristol, and he has carried us far on the way towards a full interpretation of Meteoric Phenomena; but Mr. Denning would be the first to tell us that more helpers are needed, and that much remains to be done before the riddle of the Shooting Star is solved.

A few years ago, it was thought that the photographic camera was going to register every "trail" so accurately, that the eye-observer would no longer be wanted; but we are learning that even with the most rapid lenses, and plates of extreme sensitiveness, myriads of these "streaks of light" flash past unrecorded. Now, a man who watches the flight of even one of these transient phenomena, and holds a straight stick along the line the light traversed, and notes the time and the stars near the beginning and end of its path in the sky, and also states whether the movement appeared fast or slow, and estimates the brilliance of the apparition, has given us part of the Life-History (unique in its way) of a member of the Solar System captured by our mother-earth for good and all.

A PERSEID METEOR CROSSING THE CONSTELLATION ANDROMEDA.



THE above Photograph was taken with a Common Portrait-lens on a ¼-pl. Camera. Though clock-work was used to counteract the rotation of the earth during the 40-minutes exposure, such correction is not necessary. If any Camera, focussed for distance, is simply pointed towards the sky, and any Meteor which seems to cross the field-of-view of the lens, is carefully timed, and the time of the commencement and finish of the exposure noted, a valuable record may be obtained. In this case, though, the Stars will not appear as dots on the plate; but drawn out into lines, which, however, are easily distinguished from Meteor trails.

F. W. LONGBOTTOM.

# KINGSLEY MEMORIAL PRIZES

ARE OFFERED UNDER THE FOLLOWING CONDITIONS:—

## CLASS I.

**To any Resident in the Society's District.**—A Prize not exceeding **Ten Pounds** for the best Collection of Objects, or Essays, or Notes of Observations, or Photographs illustrating the Natural Science of the Society's District.

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the Competitors.

Collections, or Essays, or Notes, must be sent to the General Secretaries on or before September 1st, and the awards will be made at the Conversazione next succeeding.

The Committee have the option of retaining successful Collections, &c., for the Society.

## CLASS II.

**In order to encourage the study of Natural History among younger Students, not exceeding 17 years of age, and residing in the Society's District, *i.e.*, Cheshire and North Wales, the following Prizes and Certificates are offered, viz.:—**

**The FIRST PRIZE in each Class will be HALF-A-GUINEA, together with the Society's Certificate.**

**Collections, Essays, or Photographs not gaining a Prize, may be awarded Certificates if found to be of sufficient merit.**

1.—For the best account of the Life-History of the Silkworm, describing its mode of life and the method of rearing. Credit will be given for careful drawings of the various stages in its life, and for actual specimens of the Silk produced.

2.—For the best descriptions, with drawings, of the development from the seed to the unfolding of the first foliage-leaf, of the following Plants: Horse Chestnut; Maize; Mustard (or Radish); Bean; Sycamore.

3.—For the best descriptions and drawings of a twig and dissected bud of the following Trees: the Oak; Ash; Horse Chestnut; Beech; Sycamore; and Lilac. Some explanation should be given of the means by which bud protection is effected in each case.

4.—For the best Map and description of the principal Constellations visible on any Evening in April, with notes of the position of any Planets (including the Moon) above the horizon at the time. The date and hour to be stated.

5.—For the best account of the Life-History of the Robin (Redbreast), *Erithacus rubecula.*

6.—For the best Notes on the appearance and habits of the three Common Gulls which are visitors to our district, viz.:—(1) The Black-headed Gull *(Larus ridibundus)*; (2) the Common Gull *(Larus canus)*; (3) the Herring Gull *(Larus argentatus)*.

7.—For the best four Photographs; any subject, but preferably those of scientific interest.

8.—For the best descriptions of a piece of each of the four following:—*(a)* Clay; *(b)* Red Sandstone; *(c)* Chalk; *(d)* Coal.

CONDITIONS—All the actual work must be done entirely by the Competitors, who must be under 17 years of age. Of course, assistance and instruction from Teachers and Books is permissible and desirable, but mere copied or dictated Essays will be disqualified. The Essays and Collections should be sent under a *nom de plume*, accompanied by a sealed letter containing the full name and exact age of the Competitor, to the Hon. Secretaries, on or before September 1st, 1908, free of any charge

The Collections, Specimens, &c., will be exhibited in the Grosvenor Museum after the awards have been made, due notice of which will be sent to each Competitor. No Competitor will be allowed to take more than two Prizes or Certificates.

The awards will be made at the Society's Conversazione next succeeding the adjudication.

The Committee do not bind themselves to give the full Prize in case of insufficient merit.

Any further information required can be had on application to the Hon. Secretaries.

# KINGSLEY MEMORIAL MEDAL

ESTABLISHED 1877,

"*For having contributed materially to the promotion and advancement of some branch or department of Natural Science.*"—*Vide* Trust Deed.

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"*For the reward, encouragement, and the advancement of the pursuit and study of Natural Science.*"—*Vide* TRUST DEED.

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| 1890 | ALFRED J. NIXON..... 10 | *Land and Fresh-Water Shells.* |
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| 1897 | ALFRED NEWSTEAD...£5 5s. | *Life Histories of Insects.* |
| 1900 | MISS M. BOWERS ..... £5 | *Collection of Botanical Specimens.* |
| 1901 | A. E. GOODMAN.....£5 5s. | *Collection of Photo-Micrographs, with Notes and Observations.* |
| 1902 | C. THEODORE GREEN.....£10 | *Collection of 148 Microscopical Preparations and 170 Herbarium Specimens of Micro-Fungi, together with a descriptive Catalogue and Essay on same.* |
| 1906 | HUGH H. THOMAS ...£8 8s. | *Collection of Fossil Plants from the Lower and Middle Beds of the Coal Measures of Denbighshire, together with descriptive notes of same.* |

Amounts less than £5 are also awarded annually.

## LAST YEAR JUNIOR PRIZES AND CERTIFICATES WERE AWARDED AS FOLLOWS:—

*1. For the best Collection of Leaves of Deciduous Trees. The name of the tree from which each leaf was obtained, and also its place of growth, must be given :—*

CHLORIS CONSTABLE, Higher Elementary School, Hale...**First Prize and Certificate**
MARGARET HILL MITCHAM, City and County School, Chester .....**First Prize and Certificate**
NELLIE LUCAS, Eaton School, Congleton .....**Certificate of Merit — Highly Commended**
HARRIET WOOD, ,, ,, ..... ,, ,,
CASSIE Rowley, Holt Hill Convent, Tranmere ..... ,, ,,
RUTH WARD, ,, ,, ..... ,, ,,
MAY MERCER, ,, ,, ..... ,, ,,
MAY MARMION, ,, ,, ..... ,, ,,
JOHN COLLINS MEREDITH, Port Sunlight Senior School... ,, ,,
EILEEN ROSS, Dr. Williams' School, Dolgelley ..... ,, ,,
LILY CLARK, Victoria Road School, Chester ..... ,, ,,
LILY VICKERS, ,, ,, ..... ,, ,,
NINA ASTLEY, Pulford School, near Chester .....**Certificate of Merit**
LIZZIE COPPLE, Holt Hill Convent, Tranmere..... ,, ,,
MAY COPPLE, ,, ,, ..... ,, ,,
ALICE O'HARE, ,, ,, ..... ,, ,,
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ALFRED WALKER, Astbury National School, Congleton... ,, ,,
GERTRUDE HUGHES, Tilston School, Malpas ..... ,, ,,
EDWARD EVANS, ,, ,, ..... ,, ,,
WINIFRED KELLY, Cheadle Heath Council School..... ,, ,,
HILDA WARK, ,, ,, ..... ,, ,,
ELIZABETH MCGRATH, St. John's R.C. School, New Ferry ,, ,,
ANNIE LOUGHTON, Victoria Road School, Chester ..... ,, ,,
MAY TILSTON, Christ Church Girls' School, Chester ..... ,, ,,
GLADYS EMILY VENABLES, ,, ,, ..... ,, ,,
CONSTANCE RILEY, Hightown Girls' Council School, Crewe ,, ,,
ADA POTTER, ,, ,, ,, ,,
FRANK MORRIS, Sandbach Grammar School ..... ,, ,,

*2. For the best Collection of dried specimens showing (1) the unopened buds, (2) the expanded bud, (3) a fully-developed leaf, (4) the flowers, (5) the fruit, of the Horse Chestnut Tree :—*

THOMAS A. WEAVER, Christleton ..... .....**First Prize and Certificate**
MARIA HILL, Storeton School, Birkenhead .....**Certificate of Merit**
LILY CLARK, Victoria Road School, Chester ..... ,, ,,
LILY VICKERS, ,, ,, ..... ,, ,,
OLIVE HARDING, Ridley Council School, Tarporley ... .. ,, ,,

*3. For the best account of a Natural History Ramble :—*

FRANK WALKER, Port Sunlight Senior School.....**First Prize and Certificate**
GORDON MILN, K.S., King's School, Chester .....**Special Prize and Certificate**
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LIONEL HUMPHRY-WILLIAMS, King's School, Chester ... ,, ,,

*4. For the best collection of Land and Fresh-Water Shells; the specimens to be mounted on cards, and the locality given :—*

GEORGE L. ASTLE, Eaton School, Congleton .....**Special Prize and Certificate**
PERCY WEATHERBY BOON, ,, ,, ..... ,, ,,
HECTOR DAVENPORT, ,, ,, ..... ,, ,,
WILLIAM H. SOLMAN, ,, ,, ..... ,, ,,

*5. For the best account of the Life History of the Swallow (Hirundo Rustica):—*

MARJORIE HUMPHRY-WILLIAMS, Queen's School, Chester ..... **First Prize and Certificate**
WILLIAM OSWALD WORSLEY, Witton Grammar School, Northwich ..... **Special Prize and Certificate**
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ELLEN DUGGAN, ,, ,, ... ,, ,,
MICHAEL BOWE, ,, ,, ... ,, ,,

*6. For the best account of the Surface Geology of Cheshire and Flintshire, to be accompanied by a Map:—*

ALBERT EGERTON LATHAM, Sandbach Grammar School...**First Prize and Certificate**
FRANK LUNT, ,, ,, ...**Certificate of Merit**

*7. For the best four Photographs of Landscape with Animals:—*

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# "KINGSLEY MEMORIAL" FUND.

**Dr.** Statement of Accounts for the Year ended 30th April, 1908. **Cr.**

| 1907-8 | £ | s. | d. |
|---|---|---|---|
| To Balance from last Account | 4 | 11 | 5 |
| ,, Dividend on Great Western Railway Company Consolidated Ordinary Stock | 15 | 6 | 6 |
| ,, Repayment of Income Tax for last 3 years .... ... | 2 | 8 | 7 |
| | £22 | 6 | 6 |
| To Balance in Bank ..... | £11 | 3 | 3 |

| 1907-8. | £ | s. | d. |
|---|---|---|---|
| By Prizes awarded as follows: | | | |
| Mr. A. H. Thompson..... | 1 | 1 | 0 |
| Mr. J. A. S. Stendall..... | 1 | 1 | 0 |
| ,, Amount paid for Junior Prizes ..... ..... .... | 5 | 9 | 0 |
| ,, Printing Account ..... | 2 | 8 | 6 |
| ,, Account for Certificates of Merit ..... | 1 | 1 | 9 |
| ,, Engraving Medal for 1907 | 0 | 2 | 0 |
| Balance..... | 11 | 3 | 3 |
| | £22 | 6 | 6 |

*7th May*, 1908—Examined and found correct,

GEORGE P. MILN, HON. TREASURER.

W. W. SIDDALL, AUDITOR.

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2.—As the Library is intended for purposes of study and reference, Members are expected to abstain from conversation which may be disturbing to other readers.

3.—Members are requested not to replace Books on the shelves, but to give them to the attendant for replacement.

4.—No Periodicals belonging to either Society are to be taken out of the Library.

5.—The Books belonging to the Archæological Society are intended as books of reference, and must not be taken away.

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*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their names are retained on the Society's Books, and their subscriptions considered due, until notice has been given to the contrary, according to Rule 9.*

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•Fish, Rev. A. H., B A., B.Sc. ..Abbot's villas, 45, Liverpool road
Fish, Mrs. ..... " "
Fish, Mr. Cecil E., B.A., M.B., B.C. (Camb.), M.R.C.S., L.R.C.P. (Lond.)..... } Llanbedr Hall, Ruthin, N. Wales
FitzGerald, Dr. W. A.....Clare Lodge
Fleming, Mr. T. R. .....Rowton Grange
Fleming, Mrs. ..... " "
Fletcher, Miss .....Gleneden, Curzon park
Fletcher, Miss E. B. ..... " "
Float, Mrs. S. M.....20 Upper Northgate street
Fluitt, Miss ..... 5 Abbey green
Forster, Mr. W. Angus .....Belgrave Lodge, Pulford, Chester
Francis, Mr. H. K. .....63 Bridge street row
Frater, Mr. Geo. .....4 Leaside, Rhosddu, Wrexham
Frater, Mrs. ..... " " "
Freeman, Mr. C. E. .....Branksome, Brook lane
Freeman, Mrs. ..... " "
Frisby, Miss .....16 Chichester street
Frost, Mr. J. G., J.P. .....Boughton Hall
Frost, Mrs. ..... " "
Frost, Mr. J. M., J.P. .....Upton Lawn
Frost, Mr. T. Gibbons .....Mollington Hall
Frost, Mrs..... " "

Gardner, Mr. E..... .....Saighton House, Chester
Garnett, Mrs..... .....The Rectory, Christleton, Chester
Garnett, Mr. J. W. .....45 Bridge street row
Garnett, Mrs..... " "
Garnett, Mr. J. G., M.A. .....Arnold House, Chester
Garnett, Mrs..... " "
Garside, Mr. Franklin .....Lingards, Prestatyn
Gaulton, Miss Lucy .....6 The Groves
Gibson, Major .....Buckley, *via* Chester
Gibson, Mr. R. M. .....Greenbank, Buckley
Gibson, Miss ..... Witton House, Roodeye
Giffen, Mr. J. T. M., F.R.C.S. ..Richmond Hill, Boughton
Gilbert, Mr. Egerton .....21 Eaton road
Gilbert, Mrs. ..... " "
Giles, Mr. E. S.....Gowymede, Vicar's Cross
Giles, Mrs. ..... " "
Gleadowe, Mr. H. T. S. .....11 Stanley place
Golder, Mr. Jas. T. ..... Westminster park

*Goodman, Mr. A. E. .....Oakdene, Tarvin road
Goodman, Mrs. W. ..... " "
Goodhart, Mrs. E. S. .....100 Watergate flags
Gore, The Ven. Archdeacon, D.D...Bowdon, Cheshire
*Graham, Mr. J. Menteith.....36 King street
Graham, Mrs..... " "
Graham, Mr. Victor P..... " "
*Granger, Mr. F. M., M.R.C.S., L.R.C.P...18 Nicholas street
Grantham, Rev. H. .....S. Mary's Rectory
Grantham, Miss Gwynydd ..... " "
Gray, Miss .....6 Lorne street
Greatbanks, Mr. J. .....Kilmorey, Hoole road
Greenhouse, Mr. Chas. .....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S., M.B.M.S. } 31 Shrewsbury road, Birkenhead
Greig, Mrs. .....Anfield, Dee banks, West
Griffin, Rev. C. A. .....The Vicarage, Dunham o'-the-Hill
Griffin, Mrs .... ..... " " "
Griffith, Mr. G. R., J.P. .....Grosvenor street
Griffith, Mr. G. B..... .....13 St. Martin's fields
Griffiths, Mr. John .... .....77 Parkgate road
*Griffiths, Rev. T. T., M.A., R.N., H.M.S. "Isis" .. } Stirton, Victoria road, N., Southsea, Hants.
Griffiths, Mrs. Robert .....West Hey, Hough green
Griffiths, Miss Bessie ..... " "
Griffiths, Mr. R. ..... " "
Griffiths, Mr. W. A.....3 Exton park
Griffiths, Mrs. ..... " "
Griffiths, Mr. John .....Ball's Hall, Rossett
Griffiths, Miss..... " "
Griffiths, Miss M. J. ..... " "
Griffiths, Mr. T. H. .....57 Ermine road, Hoole
Grills, Dr. .....The Asylum, Chester
Grills, Mrs ..... " "
Grindley, Mr. J.....3 Eastgate street

Haigh, Mrs. James Alfred .....3 The Groves
Hale, Mrs. A. G. .....4 Abbey square
Hale, Miss C. P. ..... " "
Hales. Miss .....Cop House, Sealand road
Hall, Mr. James.....24 Saughall road
Halsall, Miss .....4 Heath terrace, Boughton heath
*Hamilton, Mr. A., F.R.C.S., J.P...16 White friars
Hamilton, Mrs. ..... " "
Hamilton, Mr. A. G., M.B. ....23 Hoole road
Hamilton, Mrs. ..... " "
Hannon, Miss.....92 Foregate street
Harris, Mr. T. .....Claremont, Dee banks
Harris, Mrs. ..... " "
Harris, Rev. H.....16 Hough green
Harris, Mrs. ..... " "
Harris, Mrs. S. H.....Dyreham, Wrexham road
Harrison, Mrs. ..... Highfield, Curzon park
Harley, Mr. T. D.....41 Cheyney road
Harvey, Miss .....Fern Lea, Stamford Bridge, nr. Chester
Haselden, Mr. J. H.....Delamere street
Haswell, Mr. G. H. .....Highfield, Queen's park
Haswell, Mrs..... " "
Haswell, Mr. W. H.....94 Foregate street
Haswell, Mr. Geo. W.....28 Bouverie street
Haswell, Miss F. E. .....31 Parkgate road

Hatch, Mr. Herbert A., M.Sc. ..The Grosvenor Museum
Hatton, Mr. William .....Figdale, 25 Lorne street (North)
Hatton, Mrs. ..... ,, ,, ,,
*Hawkins, Mr. J. M. .....Fernleigh, Glan Aber park
Hawley, Mr John George .....42 Newgate street
Hayes, Mr. J. .....Grosvenor Park Hotel
Heeley, Miss .....24 Moss bank, Parkgate road
Henderson, Mr. J. E. .....19 Pathway, Queen's park
Henderson, Mrs. .....9 Union walk
Henshall, Mr. James, Junr.....22 Bouverie street
Heppel, Miss .....39 Lord street
Heppel, Mrs. .....Windsor Lodge, Mickle Trafford
*Hetherington, Mr. T. .... .... Engineers' Department, The Post-Office, Glasgow
Hewitt, Mr. D. L.....2 Hough green
Heywood, Mr. H. A. .....Christleton Lodge
Higgins, Mr. F. W. .....14 Egerton street
Higginson, Mr. T .....Engelberg, Percy road
Hignett, Mrs. T. H.....Shandon, Hough green
Hignett, Mr. H. Napier ..... ,,
Hobbs, Mr. C. J. .....2 Eversley park
Hobbs, Mrs. ..... ,, ,,
Hobday, Mr. Jas. .....Alexandra Villa, Liverpool road
Hobday, Mr. Wm. Edward.....22 The Groves
*Hodge, Mr. J. Philp .....7 Hoole park, Chester
*Hodges, Mr. W. .....62 Hough green
Hodgson, Mr. Wm. W. .....65 Northgate street
Hodkinson, Mr. E. .....9, Abbey street
Hogarth, Mr. T. O., M.I.Mech.E...The Lodge, Saltney
Holland, Miss.....17 Chichester street
Holland, Mr. W. .....Ashwood, 10 St. John's road, Queen's park
Holland, Mrs. ..... ,, ,, ,,
Holme, Rev. Canon, M.A. .....Great Budworth, Northwich
Holmes, Mrs. J. G. .....Belmont, Curzon park
Holmes, Mrs. L. B. .....Ashcroft, Hough green
Holme, Mr. Samuel H. .....Downswood, Liverpool road
Holt, Mr. T. J. W., B.Sc. .....13 Ermine road
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopley, Mr. J. H. .....6 Northgate street
Hopley, Mrs. ..... ,, ,,
Hopton, Mr. W. A. .....24 Moss bank, Parkgate road
Hopton, Mrs. ..... ,, ,,
Hopwood, Miss ..... .....The Deanery
Hornby, Mr. Alex. .... ..... Shipgate House
Hornby, Mrs. ..... ..... ..... ,,
Horner, Mr. W. .. .....42 Grey Rock street, Liverpool
*Howard, Mr. F. T., M.A , F.G.S.West Mount, Waverton
Howard, Mrs. ..... ,, ,,
Howson, Miss ..... ..... The Rectory, Guiseley, Yorks.
*Howe, Rev. W. Norton, M.A. ..The Parsonage, Mow Cop, Cheshire
Howick, Mr. T. S. Keith ... 22 St. Martin's Fields
Howitt, Mr. J H., M.A., LL.B., M.R.C.S., L.R.C.P. .... } Lyme Regis, Hough Green
Hubback, Miss C. J. M. ..... City and County School for Girls
Hughes, Mrs. McKenny.. ... Ravensworth, Brooklands avenue, Cambridge
Hughes, Mr. John ... 47 Victoria street, Westminster, London
*Hughes, Mr. T. Cann, M.A., F.S.A...78 Church street, Lancaster
Hughson, Mr. Arthur .....2 Eastgate row, north
Hughson, Mrs. ..... ,, ,,
Hughes, Miss Winifred .....6 Baths street
Hughes, Mr. W. H..... Moss Bank, Newton-by-Chester

Hull, Mr. G. S. N. ..... 51 Gladstone avenue
Humberston, Mrs. ..... 11 Pelham crescent, London, S.W.
Humphreys, Mr. E. Noel, F.C.A. ... Caer-y-Cael, Hoole
Humphreys, Mrs. ..... ,, ,,
Hunter, Mr. Jas. ..... Maisonette, Hough Green
Hunter, Mrs. ..... ,, ,,
Hutton, Mr. F. W. ..... 53 Greenway road, Runcorn

Illingworth, Mr. F. H. ..... 12 Liverpool road
Illingworth, Mrs. ..... ,, ,,
Ireland, Mr. J. D. ..... Kilrae, 16 Granville road

Jack, Mr. A. S ..... Belle Vue, 72 Hough green
Jackson, Miss ..... 52 Hough green
*Jackson, Mr. Randell, M.B., M.Sc. ... 67 Hoole road
Jackson, Mrs. ..... ,, ,,
Jackson, Rev. A. E., M.A. ..... The College
James, Mr. J. F. ..... 1 Mount Pleasant, Saltney
Jameson, Miss ..... 128 Brook street
*Jebb, Mr. G. R., C.E. ..... Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S. } 12 Upper Northgate street
Jenner, Mr. H. A. ..... 11 White Friars
*Johnson, Mr. M., L.D.S.I. ..... 21 York villas, Lorne street, north
Johnson, Mr. Thomas C. ..... 30 Eastgate row
Johnson, Mrs. Mayo ..... 10 Lorne street
Johnson, Mr. H. P ..... Highclere, Brook Lane
Jolliffe, Mr. H. D. ..... Kilbroney, Curzon park
Jones, Mr. Joseph ..... 7 Gladstone road
Jones, Miss ..... 3 Lorne street
Jones, Mr. Jno. ..... The Spinney, Hunter street
Jones, Mr. David Brellisford .... Avoca, Garden lane
Jones, Mr. Owen E., J.P. ..... Tynrheol, Amlwch
Jones, Mr. Fred ..... 112 Foregate street
Jones, Miss A. E. ..... Higher Grade School, Hunter street
Jones, Mrs. W. H. ..... Cliveden, Hough green
Jones, Miss Gertrude B. ..... ,, ,,
Jones, Mrs. Evan ..... Bodrenig, Bala, N. Wales
Jones, Mrs. Wm. ..... 33 Cuppin street
Jones, Mr. Henry ..... Gwynedd, 131, Boughton
Jones, Mr. Robert W. ..... 39 Gladstone road
*Jones, Rev. Richard. B.A. ..... 36 Eaton road
Jones, Mrs., B.A. ..... ,, ,,
Jones, Mr. E. B. ..... 12 Queen's avenue
Jones, Mr. Charles ..... 50 Princess street
Jones, Mr. Eric Marsden ..... Tilston Rectory, Malpas
Jones, Mr. George ..... 20 George street
Jones, Mr. W. Llewelyn ..... The Oaks, Helsby
Jones, Mr. John, J.P. ..... Coniston, Newton, Chester
Jowitt, Miss Lettice ..... City and County School for Girls
Joyce, Rev. Canon G. C., M.A. ... St. Deiniol's Hostel, Hawarden

Kember, Miss M. ..... 8 The Groves
*Kennedy, Mr. J. B. ..... Dee Bank House
Kenyon, Mr. G. A., M.B. ..... Poplar House, Flookersbrook
Kenyon, Mrs. ..... ,, ,,
Killon, Mr. R. W. ..... 59 Tarvin road
Killon, Mrs. ..... ,, ,,
Kind, Mrs. ..... Stoneby Drive, New Brighton

*King, Dr. H. W. .....26 Nicholas street
King, Mrs..... „ „
*Kingsley, Miss .....Keys, Eversley, Winchfield
Knight, Miss.....8 Eastgate row
Knowles, Mr. E. R.....15 Grosvenor street
Knowles, Miss ..... „ „
Kynnersley, Mr. E. M. Sneyd ..Boughton Lodge

Laing, Miss S. C. .....2 Mount Pleasant, Saltney
Lamb, Mr. R., J.P.....Hoole Road
Lamb, Mrs. .. ..... „
Lamb, Mr. R., Junr. .....Yrfon, Granville Road
Lamb, Mrs. .. ..... „ „
Lamb, Mr. W. A.....6 St. Anne street
Lamont, Mr. A. .....Oldfield road, Heswall
Lancaster, Mr. Arthur .....14 Weaver street
Lanceley, Mr. R. H , J.P. .....Victoria road
Latham, Mr. J. S. .....Green bank, Liverpool road
Latham, Mrs..... .. „ „
*Lawrence, Dr. A.....The Asylum, Chester
Lawson, Mr. Philip H. .....St. Eilian, Newton
Laybourne, Mr. J. H. .....21 The Groves
Laybourne, Mrs. ..... „ „
Leah, Mr. W. .. .....Strathearn, Hoole road
Leaton, Miss Isabel .....Glanavon, Boughton
Lees, Mr. W., M.R.C S. .....The Bars
Lewis, Rev. J. S., M.A. .....The Vicarage, Ruabon
Lincoln, Captain C. .....18 Chichester street
Lloyd, Sir Horatio, Knt. .....8 Stanley place
Lloyd, Mr. F. Horatio ..... „ „
*LLoyd, Colonel Wilford N., J.P..Eccleston hill, Chester
LLoyd, Mrs. ..... „ „
Lloyd, Miss M. E.....13 Chichester street
Lloyd, Miss C. .....62 Princess street
Lloyd, Mr. G.....38 Duke street
Lloyd, Mr. W. H.....Glenhurst, Hoole road
Lockwood. Mrs. .....Fern House, Queen's park
Lockwood, Miss.....6 Spring gardens, Hoole
Lodge, Mr. Geo. T. .....9 Hoole road
Lomas, Mr. A. M. .....Parr's Bank, Limited, Chester
*Longbottom, Mr. F. W., F.R.A.S...Haslemere, Queen's park
Longbottom, Mrs..... .... „ „
Lorimer, Mr. J. A. .....c/o Mr. A. E. Lovell, 75 Bouverie street
*Lovell, Mr. A. E., M.A. .....75 Bouverie street
Lovell, Mrs. ..... „ „
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C S..... } 18 Hough green
Lowe, Mrs. ..... „ „
Lowe, Mr. Jas. F., B.A..... 47 Dee banks
*Lucas, Mr. A. W., F.G.S. .....4 St. John's road, Queen's park
*Lysaght, Colonel .....Watergate House

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Miss Eva, M.A. .... „ „
*Macdonald, Mr. G E., L.D.S.E...10 Bladud buildings, Bath
Macdonald, Dr. W. G. G. .....25 White Friars
MacGillycuddy, Major, J.P. ....Ballinagroun, Aunascaul, R.S.O., co.Kerry
MacGillycuddy, Mrs. ..... .... „ „ „
Maddocks, Mr. Frank .....Briar Dene, Percy road
Maddocks, Mrs. ..... „ „

Makepeace, Mr. Herbert.....26 Churton road
Mann, Dr. A. .....18 Newgate street
Mann, Mrs. ..... " "
Mann, Miss..... " "
*Manning, Mr. J. B. .....27 Perryn road, East Acton, London, W.
Marriott, Mr. J. W.....The Grosvenor Museum
Marsden, Miss .....6 Grosvenor Park road
Marshall, Mrs. A.....Smithfield Cocoa House, 5 Brook street
Marshall, Major.....Greystones, Waterloo Road
Marsland, Miss Sarah .....60 Gladstone road
Marsland, Miss Mary ..... " "
Massey, Miss .....10 Baths street
Mason, Mr. F. B.....39 Liverpool road
Mason, Mrs. ..... " "
Matheson, Mr. Alex., B.A. ....20 Castle street
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
Matthews, Miss.....County Asylum, Chester
Matthews, Mr. A. E. ..... 5 Parkgate road
McKinlay, Mr. J.....31 Cheyney road
*McMichael, Mr. J. A., B.A., B.Sc...39 Parkgate road
McMichael, Mrs. ..... " "
Meacock, Miss .....c/o Mr. R. R. Salmon, Holly bank, Rowton
Meeson, Mr. W. H.....16 Eastgate row
Mill, Miss F.....26 Eaton road
Mill, Miss Frances .....St. Mary's Rectory
Millington, Mr. C. .....Shordley Green, Hope, near Mold
Millington, Mrs. ..... " " "
Mills, Mrs.....15 Chichester street
*Miln, Mr. G. P.....Milnholme, Brook lane
Miln, Mrs. ..... " "
Milner, Mr. J. A., B.A. (Oxon.)..Manor Farm, Barnston, nr. Birkenhead
Minns, Mr. Alfred.....10 Marlborough terrace, Londonderry
Minshull, Mr. C. H.....5 Lorne street
*Mitchell, Rev. J. C., B.D., F.R.A.S..Brenvar avenue, Ardnadam, Argylshire
Mond, Mr. Alfred, M.P. ..... Winnington Hall, Chester
Mond, Mrs. ..... " "
Montgomery, Rev. J. K. .....Abbot's villas, Liverpool road
Moore, Mrs. H.....2 Queen's park
Moreton, Mr. T. W. E., M.R.C.S...Tarvin
Morgan, Mr. R. T. .....2 Newgate street
*Morris, The Rev. Canon, D.D., F.S.A. ..... } St. Gabriel's Vicarage, 4 Warwick square, London, S.W.
Morris, Miss C.....Avondale, Halkyn road
Mosford, Mr. John .....The Righi, Tattenhall
Moss, His Honour Judge.....50 Hough green
Moss, Mrs..... " "
Moss, Mr. Wm. Richardson ....The Oaks, Upton, Chester
Moss, Mrs..... " "
Mostyn, Sir Pyers W., Bart. ....Talacre, Holywell
Mostyn-Roberts, Mrs. R. .....Bryntirion, Chester
Mott, Mr. J. J. .....2 Panton place, Hoole
Moulton, Mr. John W. .....24 Lord street, Boughton
Mulvey, Mr. E. M. .....9 Overleigh road
Mulvey, Mr. W. E. ..... " "
Musgrave, Mr. J. .....45 White friars
Musgrave, Mrs..... " "
Musgrave, Mr. A. J. ..... " "
Musgrave, Miss..... " "
Muspratt, Mr. E. J.....Within Croft, Dee banks
Muspratt, Miss ..... " "

New, Mrs. J. M. .....The Vicarage, Backford
New, Mr. Henry .....14 Crane street
New, Mr. Wm. J..... ,, ,,
Newall, Dr. W. A. .... .....Bolland's Court House, White friars
Newall, Mrs. ..... ,, ,,
Newman, Mr. J. E. ..... .....1 Sunny bank, Queen's park
Newman, Mrs. . ..... ,, ,,
Newstead, Mrs. ..... .....Witcombe Villa, Handbridge
*Newstead, Mr. Alfred .....The Grosvenor Museum
Nicholls, Mr. G. F. .....20 Chichester street
Niven, Miss ..... 8 Seller street
Niven, Miss M. D. ..... ,, ,,
Nixon, Mrs. .....Kingswood, 33 Victoria road
Nixon, Mr. J. G. ..... ,, ,,
Norbury, Mr. T. .....Hill Crest, Upton heath
Nutting, Miss F. A. .....Gloverstone, Castle street

Ockleston, Mr. Wm. .....4 Abbot's Hayes, Liverpool road
Ockleston, Mrs. ..... ,, ,,
*Okell, Mr. E. W. .....22 Northgate street
*Okell, Mr. P. H. .....Wisbeach House, Glan Aber park
Oldmeadow, Mrs. ..... Albion House, Bold square
Orrett, Miss ..... ..... West view, Garden lane
Osborne, Mr. Geo. F. .....9 Sumpter pathway, Hoole
Owen, Mr. A. ..... .....1A Halkyn road, Hoole
Owen, Mr. W. J. ..... ,, ,,
Owen, Mr. James ..... ..... 23 Gladstone road
Owen, Mrs. ..... ,, ,,
*Owen, Mr. R. Cecil, B.Sc. .....89, Foregate street
Owens, Mr. John ..... ..... 5 Grey friars
Owens, Mrs. ..... ..... ,, ,,
Oxenbould, Mrs. ..... .....4 Abbey street

Page, Miss ..... ..... ..... c/o Miss Ellis, Mount Pleasant, Saltney
Parr, Mr. H. A. .....The Cottage, Flookersbrook
*Parry, Mr. T. S., M.B. .....10 Upper Northgate street
*Parry, Mr. Morys ..... ..... 37 Victoria road
Parry, Mr. Robert .....Westcote, Hoole road
Parry, Mr. Samuel ..... ..... 4 Princess street
Partington, Miss A. ..... ....Deva Lodge, Prestatyn
Pate, Mr. Thomas..... ....29 Chichester street
Paxton, Mr. F. ..... ..... Belmont House, Dee banks
Paxton, Miss ..... ,, ,, ,,
Payne, Miss ..... ..... ..4 Abbey green
Payne, Miss A. ..... ,, ,,
Payne, Mr. H. C. ..... .....The Cottage, Eccleston
Pearson, Mr. F. C. ... .....Huke's Library, The Eastgate
Pearson, Mrs. ..... ..... ....Fircroft, Hough green
Pearson, Miss G. ..... ,, ,,
Pell, Dr. ..... ..... ..... Dee banks
Pell, Mrs. ..... ,,
Phillips, Rev. J. ..... ..... .....St. Barnabas' Mission House, Sibell street
Polkinghorne, Mr. Chas. ..... 47 Tarvin road
Potter, Mr. William ..... .....18 Vandyke street, Liverpool
*Potts, Mr. A., M A. ..... .....Diocesan Training College
Potts, Miss L. S. ..... .....17 Hough green
Powell, Mrs. T. J. ..... .....37 White friars
Powell, Miss ..... ..... .....38 Eastgate row
Powell, Miss A. L. ..... .....11 Chichester street
Poyser, Mr. Henry ..... .....34 Nicholas street

Preece, Sir Wm. H., K.C.B., F.R.S...Penrhos, Carnarvon
Preston, Mr. A. M. .....Abbot's Grange, Liverpool road
Price, Mr. Edwin .....Sunnyside, 3 Cambrian view
Prichard, Miss .....9 The Groves
Pringle, Mr. Wm.....30 Cambrian crescent
Proud, Miss M. H. .....Ashmount, Tarvin road
Pye, Mr. Fred A. .....Highfield Park, Rhyl
Pye, Mrs. ..... " "

Raby, Mr. E. J. .....13 Vicarage road, Hoole
Read, Mrs. .....Kenwyn, Dee banks
Redman, Mr. W. R., B.A., B.Sc...Inglewood, Brook lane
Reese, Mr. J. E. .....39 Halkyn road
*Reid, Mr. Alexander, M.Inst. C.E., M.E., F.G.S. } Witton Lodge, Hoole road
Reynolds, Mr. G H. .....67 Liverpool road
Ribton, Mrs. .....Cartref, Glan Aber Park
Rigby, Miss Honora M. .....2 Abbot's Hayes, Chester
Robb, Mr. J. D. .....37 Northgate street
Robb, Mrs. ..... " "
Roberts, Miss .....Bank Cottage, Neston
Roberts, Miss Johnson .....West Point, 40 King street
Roberts, Mr. B. C., J.P. .....Oakfield, Upton
Roberts, Mrs ..... "
Roberts, Mr. J. Sheriff, J.P. ....The Gables, Curzon park
Roberts, Mrs. ..... " "
*Roberts, Mr. John Thos., M.B...Montana House, 127, Boughton
*Roberts, Mr. E. Owen.. .....144 Boughton
Roberts, Mrs. .....The Nook, Westminster park
Roberts, Mr. Frank E , J.P. ....3 Sandown terrace
Roberts, Mr. W. M. .....The Shrublands, Hoole
Roberts, Miss Clara .....Washington Hotel, Chester
Roberts, Mr. W. H. .....6 Ash grove, Wrexham road
Robertson, Mr. H. R., F.R.M.S...Upton grange
Rogers, Mr. James .....22 Black friars
Rogers, Mrs. ..... " "
Rogers, Mr. William .....104 Watergate flags
Rogers, Mr. C. W. ..... " "
Rogers, Mr. Arthur Leslie .....24 Lorne street
Rogerson, Mr. G. H. .....Polefield, Liverpool road
Rose, Mr. W. R. .....23 Bridge street row
Royle, Mrs. .....Hough Green House
Rutherfoord, Dr. .....8 Abbey square

Sadler, Mr. James H. .....24 Albion street
Salmon, Miss Maud .....39 White friars
Savage, Colonel.....20 Curzon park
Scouller, Mr. Walter, B.Sc. ....8 Moss Bank, Parkgate road
Scotland, Mrs. .....Vicar's lane
Scott, Mr. John .....Brook lane
Scott, Rev. Canon S. Cooper, M.A...St. John's Rectory
Segar, Mr. F., L.D.S.E. .....White Friars House
Sewell, Mr. F. C. .....1 White friars
Sexaner, Miss.. .....43 Foregate street
Shacklock, Miss .....3 Deva terrace
Shand, Miss E. M. .....Kingston House
Shand, Miss E. F. ..... " "
Sharkey, Mr. J. .....Inland Revenue Office, St. John street
Shaw, Mr. R. G. .....6 Bridge street
*Shepheard, Mr. T., F.R.M.S. ..Kingsley, Bournemouth
Shepheard, Miss ..... " "

Shepheard, Mr. W. F. J., F.C.S...Bridge street row
Shepheard, Mrs. .....Eversley, Hoole
Shires, Miss M. .....80 Brook street
*Shone, Mr. W., F.G.S. .....Upton Park
Shone, Miss G. ..... ,,
Shone, Mr. Wm., Junr. ..... ,,
Shuttleworth, Mrs. A. .....Waterside Lodge, Barrelwell Hill, Boughton
*Siddall, Mr. J. D. .....23 Eaton road
Siddall, Mrs. ..... ,, ,,
Siddall, Miss G. M. ..... ,, ,,
Siddall, Mr. Charles Kingsley .. ,, ,,
Siddall, Mr. T. A. ..... ,, ,,
Siddall, Miss Amy M. ..... ,, ,,
Siddall, Mr. W. W. .....Percy road
Siddall, Mrs. ..... ,,
Sill, Mr. T. S. .....Bridge Colour Co., Ltd., Stalybridge
Simon, Mr. John .....4 Eastgate row
Simon, Mrs. ..... ,, ,,
Simpson, Mr. Ricardo .....Newton Bank
*Simpson, Mr. Frank. .....10 Grosvenor street
*Skeat, Miss E. G., D.Sc. .....The Queen's School
Skeldon, Mr. J. .....20 West Lorne street
Skelton, Mr. J. M. .....4 Ash grove, Wrexham road
Skelton, Mrs. ..... ,, ,,
Skipwith, Mr. Francis, J.P. ....9 Eversley park
Smith, Mr. Cecil P. .....Newton Hall, Chester
Smith, Miss H. .....3 Abbey green
Smith, Mr. T. .....9 White friars
Smith, Mr. Emanuel L .....14 St. Werburgh street
Smith, Mr. T J. F., F.R.A.S. ..Newstead, Wavertree, nr. Liverpool
Southworth, Mr. Joel .....10 Paradise row
Sparling, Rev. W., M.A. .....Upton Vicarage, Chester
Spencer, Mrs. W. A. .....30 Hough Green
Spencer, Miss Annie .....50 Eastgate row
Spurling, Rev. Canon F. W., M.A...9 King street
Stephen, Mrs. Peter .....Crosslooms, Mollington
Stevens, Mr. T. .....14 Eastgate row
Stewart, Mrs. .....13 Stanley place
Stewart, Rev. William, B.A. .....23 Percy road
*Stirling, Mr. James .....21 Cyprus road, Finchley, London, N.
Stolterfoth, Mrs. .....1 Grey friars
Storr, Mr. F. .....19 The Groves
Storr, Miss ..... ,, ,,
Storrar, Mr. Andrew, J.P. .....Bryntirion, Chichester street
Stowe, Mr. F. .....The Grosvenor Museum
Sturge, Mr. F. A. .....Coed Efa, Wrexham
Stubbs, Mr. E. .....Bache Hall Gardens
Summers, Mrs. .....Bache Hall
Sutton, Mr. D. Carlyle, M.B. ..62 Watergate street
Sutton, Miss ..... ,, ,,

Tait, Miss Daisy .....c/o Miss Webster, 2 Nicholas street
Tasker, Mr. W. .....Moulson House, Hoole road
Tasker, Mrs. ..... ,, ,,
Taylor, Mr. J., F.R.C.S., J.P. ..Haygarth House, 28 Nicholas street
Taylor, Miss ..... ,, ,,
Taylor, Dr. J. G., M.A. .....35 Nicholas street
Taylor, Mr. A. G. .....6A Woodsome road, Highgate road, London, N.W.
Teaves, Miss .....79 Hoole road

Thomas, Dr. E. J. Haynes .....18 Pepper street
Thomas, Miss..... ..... ,, ,,
Thomas, Miss Constance ..... ,, ,,
Thomas, Miss F. M..... ,, ,,
Thomas, Mr. Maurice .....41 Halkyn road, Hoole
Thomas, Mr. E. H. .....The Industrial Schools, Boughton
Thomas, Mr. W. C.....56 Northgate street
Thomas, Mr. H. F. .....1 Victoria pathway, Queen's park
Thomas, Mrs. ..... ,, ,,
Thomas, Mr. A. E , B.A., M.B...Medical Officer of Health, Forest House
*Thompson, Mr. Joseph .. .....20 South view, Sealand road
Thompson, Mr. Edward P.....Paulsmoss, Whitchurch, Salop
Thompson, Miss Ethel .....19 Cheyney road
Thomson, Miss I. .....9 Cambrian view
Thomson, Mr. J. R., J.P. .....Uffington House
Thomson, Mrs. ..... ,, ,,
Thornthwaite, Mr. Noel .....c/o Mrs. Hincks, Brantwood, Brook lane
Thornthwaite, Miss E. M. ..... ,, ,, ,,
Thornthwaite, Miss H. L. ..... ,, ,, ,,
Thornton, Miss .....St. Mary's Cottage, Handbridge
Tilston, Miss ..... .....Harlestone, Newton lane
Tobias, Mr. John .....Crypt Chambers, Eastgate row
Tomkinson, Mr. Jas., M.P.....Willington Hall, Chester
Townshend, Mr. C.W., J.P. ...Charlton Kings, Cheltenham
Trevor, Mr. Warren ..... .....Redlands House, Hough green
Trott, Rev. H. W. .....Manor House, Saighton
*Tupling, Mr. C..... .....Wirral House School, 4 The Bars
Turner, Mr. Edward ..... .....Bridge Cottage, Port Sunlight
Tyson, Miss Alice.....9 Frodsham street

Venables, Mr. W. H, .....100 Faulkner street, Hoole
Vernon, Mr. W., J.P. .....57 Upper Northgate street

Wakefield, Mr. Robert .....Stockton Heath, Warrington
*Walker, Mr. A. O , F.L.S., J.P...Ulcombe place, near Maidstone
Walker, Mrs..... ,, ,,
Walker, Mr. Ernest .....8 Sibell street
Walker, Mr. John Stringer.....2 Abbey green
Walker, Miss Kate .....4 Grey friars
Walker, Mr. C. G. .....11 The Groves
Waller, Rev. A. H., M.A.....34 Eaton road
Walley, Mrs. .....Lyncroft, Raymond street
Walley, Mr. F. .....6 Abbey square
Walpole, Mr. John E. .....Cops Lea, Dee banks
Ward, Miss .....Derby House, Hoole road
Ward, Mr. R. P. .....4 Hough green
Ward, Mrs. ..... ,, ,,
Warmsley, Mr. F. J. .....Abbot's Holme, 69 Liverpool road
Warmsley, Mrs..... ,, ,,
Warmsley, Miss..... .....11, Vicarage road, Hoole
Warmsley, Miss L. ..... ,, ,,
Way, Mr. N. A. E. .....Bradpole, 57 Liverpool road
Weaver, Mr. John.....Fern Cottage, Christleton
*Webster, Mr. G. Watmough, F.C.S., F.R.P.S. ..... } Grange road, West Kirby
Webster, Mr. L. F. ..... ,, ,,
Webster, Miss Amy B. .....2 Nicholas street
Webster, Mrs. M. S. .....14 St. John's road, Queen's park
Weldon, Mr. T. T. .....16 Queen's road
Wells, Mr. E. .....Eccleston, Chester

Welsby, Mr. Walter.....Bosville, 25 Liverpool road
Welsby, Mrs.....,, ,,
*Welsh, Mr. John, M.R.C.S., L.R.C.P., F.C.S...43 Tarvin road
Welsh, Mrs. Wm.....34 Tarvin road
Westminster, His Grace The Duke of..Eaton, Chester
Westminster, Her Grace The Duchess of ,, ,,
Westminster, Her Grace Katherine Duchess of..Combermere Abbey, Whitchurch (Salop)
*Whichello, Mr. H., L.R.C.P., M.R.C.S...The Mount, Tattenhall, Chester
Whitworth, Mr. Samuel .....41 Tarvin road
Wigg, Mr. Walter J. .....The Firs, Newton
Wilkinson, Miss M. .....51 Granville road
Williams, Mr. John .....Blue Bell bank, Saltney
Williams, Miss Aldersey .....100 Watergate flags
Williams, Mr. James .....24 Hough green
Williams, Mr. Vincent, B.A. .... ,, ,,
Williams, Mr. A. T.....15 Cheyney road
Williams, Mr. W.....The Croft, Flookersbrook
Williams, Miss Pattie .....Greenfield, Upton heath
Williams, Mr. R. G. .....White friars
Williams, Mr. W. Heathcote ....Watford House, Victoria road
Williams, Mrs. ... ..... ,, ,,
Williams, Mr. W. R., M.A. ....Rylease, Stocks lane
Williams, Mr. Geo. .....12 Filkin's lane, Tarvin road
Williams, Miss .....4 Alma street, Boughton
Williams, Mr. J. .....27 Halkyn road
Williams, Miss Florence J.....10 Spring Gardens, Flookersbrook
Williams, Dr. Trevor .....31 Nicholas street
Williamson, Mr. A. J., B.A. Cantab..7 Brookside Villas, Hoole road
Williamson, Mr. Thomas ....Cuppin street
Withers, Miss M. P.....2 Watergate square
Withers, Miss C. ..... ,, ,,
Wolfenden, Mr. A. .....21 Hough green
Wolfenden, Miss Marion..... ,, ,,
Wood, Mr. T. H. .....8 Hough green
Wood, Miss .....30 Hough green
Woodroffe, Mr. Frank K. .....18 Vicarage road, Hoole
Woodroffe, Mrs. ..... ,, ,,
Wright, Rev. Harold H., M.A...Precentory, Abbey street
Wright, Mrs. ..... ,, ,,
Wright, Dr. R. B. .....Folliott House, 55 Northgate street
Wright, Mrs. ..... ,, ,,
Wyld, Mr. Norman .....11 City Walls
Wyld, Mrs..... ,,
*Wynne, Mr. Geo. F,.....Plas Gwyn, Minera, Wrexham
Wynne, Mr. J. H.....49 Tarvin road
Wynne, Mrs..... ,, ,,
Wynne, Mr. John .....Elm Bank, Rowton, Chester

# LIST OF JUNIOR MEMBERS

*(Under Rule 6).*

Anderson, Percy .....26 Hamilton street, Hoole
Armstrong, Frank.....Brantwood, Dee banks
Armstrong, Miss Margaret ..... ,, ,,
Atkin, Miss Cecilia .....York Villa, Hamilton street, Hoole

Bairstow, Eric John .....Burley, Queen's park
Baker, John .....29 Gladstone avenue
Baker, Miss Ella ..... ,, ,,
Barber, John Lawrence .....4 Kilmorey road
Barber, Miss May ..... ,, ,,
Bate, Roger .....Summerfield, Kilmorey park
Belton, F. W. J. .....Craigside, Sandy lane
Bennett, Miss M. Cecil .....Addiscombe, Hough green
Bleckly, Herbert .....Tentry Heys, Queen's park
Brassey, J. E. .....The Limes, Curzon park
Burges, R. O. .....Whitford, 11 Panton road, Hoole
Burton, Clifford E. .....The Limes, Weaverham, near Northwich

Clough, Miss Judith A. .....78 Hough green
Collins, Vivian .....c/o "Kings," 14 Eaton road
Croston, Miss Emily.....Holmesdale, Brook lane
Curlett, Alec.....The Mount, Queen's park
Curlett, Miss Kathleen..... ,, ,,

Day, Miss Gladys .....Bryntirion, Chichester street
Delany, Miss .....7 Lorne street (South)
Dickinson, Kenneth S. .....1 Upton view, Hoole

Ellis, Arthur .....Mosslea, 3 Chester street, Saltney
Evans, Alan .....27 Hough green

Fennah, Miss Elsie .....Park House, Grosvenor Park road
Foster, Roe .....Roade Villa, Upton park
Francis, Miss.....South Bank, Glan Aber park
Frost, Miss Linda.....Mollington Hall

Gardner, Miss .....Saighton house

Harris, Stafford Berkeley.....Dyreham, Wrexham road
Hodge, Miss Isabel .....7 Hoole park
Holmes, Miss Ruth .....Ashcroft, Hough green
Holmes, Miss Elfreda ..... ,, ,,
Humphry-Williams, Lionel E. ..St. Mary's mount, Flint
Humphry-Williams, Miss Marjorie ,, ,,

Jones, Raymond .....Cliveden, Hough green
Jones, J. H. Stanley.....Glenhurst, Hoole road
Jones, C. Brellisford.....Avoca, Garden lane

Kind, R. Gordon .....Stoneby drive, New Brighton
King, Wilfrid Lyle .....26 Nicholas street
Kirkland, Arthur ..... ...c/o Mrs. Kenyon, Flookersbrook

Laybourne, John Oscar .....21 The Groves
Laybourne, Miss Florence Ada .. ,, ,,
Lockwood, Arthur W. C. .....Clovelly House, 28 Hamilton street
Lott, George .....St. Mary's Cottage, Handbridge

McKinlay. Miss Jeanie .....31 Cheyney road
Malcolmson, Miss Efra Florence..34 Hough green
Mann, Francis Alfred Wharton ..18 Newgate street
Mann, Geoffrey Howard ..... ,, ,,
Matthews, Miss F. .....5 Parkgate road
Miln, Thos. Edward .....Milnholme, Brook lane
Miln, G. Gordon ..... ,, ,,
Miln, J. Douglas ..... ,, ,,
Miln, W. Wallace..... ,, ,,
Moore, Leslie.....60 Liverpool road

Naylor, J. L. .....4 Derby place, Hoole

Siddall, Frank .....23 Eaton road
Simon, J. Malcolm ..... ..4 Eastgate row
Simpson, Frank Burton .....10 Grosvenor street
Spencer, John Reginald .....19 West Lorne street
Storrar, James .....Newgate Street House
Storrar, Miss Ivy ..... ,, ,,
Storrar, Miss Violet ..... ,, ,,
Summers, Miss Dorothy .....Bache Hall
Summers, Miss Phyllis..... ,,

Trery, C. H. .....Alvanley Vicarage, nr. Warrington
Trott, Miss K. .....Manor House, Saighton
Turnock, Claude .....20 The Groves
Turnock, Miss Lilian D. ..... ,, ,,

Walley, Miss .....Lyncroft, Raymond street
Webster, Miss .....14 St. John's road, Queen's park
Welford, Miss .....5 Eastern pathway, Queen's park
Williams, Miss Carrie .....24 Hough green
Williams, Miss Marjory ..... ,, ,,
Williams, Miss Hilda .....26 Hough green
Williamson, Miss Annie .....Cuppin street
Wynne, John Norman .....49 Tarvin road
Wynne, Miss Hilda Mary ..... ,, ,,

***** The Committee invite special attention to the Rule for admission of Junior Members, which is as follows:—**

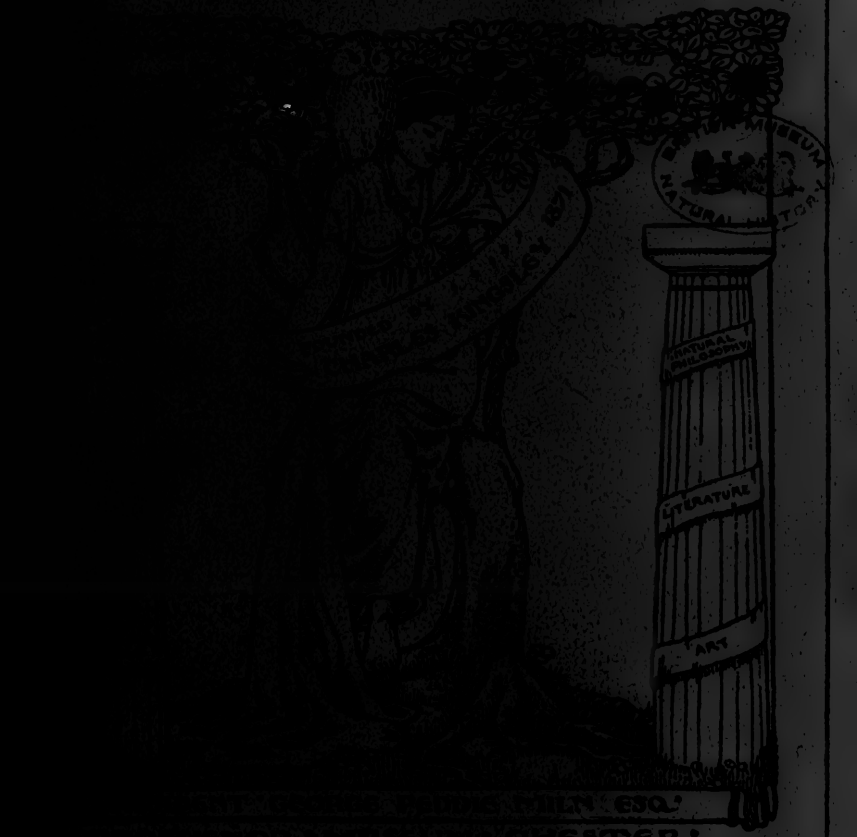
**"That Junior Candidates between the ages of twelve and "twenty-one shall be admitted, at a subscription of 2/6 "per annum, to all the privileges of the Society, excepting "that of voting."**

**It is earnestly hoped that those parents who have boys or girls interested in Natural History will allow them to join the Society, under the auspices of this Rule.**

PRESENTED
21 JUL. 1908

17 JUL. 1909

# HESTER SOCIETY
# NATURAL SCIENCE
# ATURE & ART
## EIGHTH ANNUAL
## & PROCEEDINGS




CHESTER.

## THE LIBRARY

Is open to the Members Daily from 10 a.m. to 4 p.m.; and on Thursdays (from October to May) also from 6 p.m. to 9-30 p.m.

☞ A copy of the New Library Rules is given on page 24.

***** The Catalogue of Books in the Society's Library may be obtained at 4, Eastgate Row; or from the Museum; price 3d. each.**

☞ Copies of No. III. of the Society's Proceedings (Price 2/6); No. IV. (5/-); and No. V. (2/6); may be obtained at the Museum.

Nos. I. and II. are out of print.

*Special attention is directed to the following recent publications of the Society:—*

*(a) A List of Lepidoptera found in Cheshire, Flintshire, Denbighshire, Carnarvonshire, and Anglesea, compiled by* G. O. DAY *and others (Proceedings No. V.) Price 2/6 (Post free 2/8).*

*(b) "On some Rare Arachnids captured during* 1906," *by* A. RANDELL JACKSON, M.B., M.SC. *(Part I. of Proceedings No. VI.),* 1907. *Price 6d.*

Copies may be obtained from the Curator at the Museum.

BRITISH MUSEUM NATURAL HISTORY

# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY 1871).

## THIRTY-EIGHTH

# ANNUAL REPORT

INCLUDING

## STATEMENT OF ACCOUNTS, &c.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Ten Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules:—

4.—The name of any Candidate for Membership of the Society, with those of a proposer and a seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That Junior Candidates between the ages of 12 and 21 shall be admitted, at a subscription of 2/6 per annum, to all the privileges of the Society, excepting that of voting.

7.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed thirty.

8.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each —except to the Annual General Meeting, to which Members only are admitted.

9.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrearrs.

10.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

11.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

12.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

13.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the members of the Committee present shall decide whether such meetings be postponed or not.

14.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

15.—That the Annual General Meeting of the Society shall be held in the Month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies, the election shall be by Ballot. The Officers' Reports and Financial Statement made up to the end of April, and duly audited, shall also be submitted, and read if desired.

16.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

17.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

18.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

19.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1909-1910.

## President:

GEORGE P. MILN, Esq.

## Vice-Presidents:

Prof. T. McKENNY HUGHES, F.R.S.
A. O. WALKER, Esq., J.P., F.L.S.
W. M. DOBIE, Esq., M.D., F.R.A.S.
T. SHEPHEARD, Esq., F.R.M.S.
G. R. GRIFFITH, Esq., J.P.
J. D. SIDDALL, Esq.
Rev. A. H. FISH, B.A., B.Sc.
F. W. LONGBOTTOM, Esq., F.R.A.S.
A. HAMILTON, Esq., F.R.C.S., J.P.

## Officers of Sections:

### BOTANICAL.

Chairman—Mr. J. D. SIDDALL ... ... ... ... 23, *Eaton Road*
Secretary—Mr. A. E. GOODMAN ... ... ... ... *Oakdene, Tarvin Road*

### ZOOLOGICAL.

Chairman—Dr. W. HENRY DOBIE ... ... ... 2, *Hunter Street*
Secretary—Mr. W. F. J. SHEPHEARD, F.C.S., ... *Bridge Street Row*

### GEOLOGICAL.

Chairman—Mr. A. W. LUCAS, F.G.S. ... ... ... 4. *St. John's Road, Queen's Park*
Secretary—Mr. EGERTON GILBERT ... ... ... 21, *Eaton Road*

### NATURAL PHILOSOPHY.

Chairman—Mr. G. WATMOUGH WEBSTER, F.C.S. *Grange Road, West Kirby*
Secretary—Mr. J. BAIRSTOW, F.C.S. ... ... ... *Burley, Queen's Park*

### MICROSCOPICAL.

Chairman—Dr. J. ELLIOTT, B.Sc. ... ... ... ... 24, *Nicholas Street*
Secretary—Mr. J. D. SIDDALL ... ... ... ... 23, *Eaton Road*

### PHOTOGRAPHIC.

Chairman—Mr. J. A. McMICHAEL, B.A., B.Sc. ... 39, *Parkgate Road*
Secretary—Mr. FRANK SIMPSON ... ... ... 10, *Grosvenor Street*

### LITERATURE.

Chairman—Rev. Canon F. W. SPURLING, M.A. ... 9, *King Street*
Secretary—Mr. J. MENTEITH GRAHAM ... ... 36, *King Street*

### ASTRONOMICAL.

Chairman—Dr. W. M. DOBIE, F.R.A.S. ... *Kirkton House, Hunter Street*
Secretary—Mr. F. W. LONGBOTTOM, F.R.A.S. ... *Haslemere, Queen's Park*

### ART.

Chairman—The Very Rev. Dr. DARBY ... ... ... *The Deanery*
Secretary—Mr. HORACE DAVIES, A.R.I.B.A., F.S.I. 14, *Newgate Street*

## Hon. Treasurer:

Mr. JOHN SIMON, 4, *Eastgate Row*

## Hon. Secretaries:

*Scientific*—Mr. F. W. LONGBOTTOM, F.R.A.S, *Haslemere, Queen's Park*
*General*—Mr. FRANK SIMPSON, 10, *Grosvenor Street*

## Hon. Librarian:

Mr. ALFRED NEWSTEAD, *The Grosvenor Museum*

## Committee:

The above Officers (*Ex-Officio*)
AND
Miss BEATRICE CLAY, B.A.
Miss E. G. SKEAT, D.Sc.
Rev. J. L. BEDFORD, M.A., F.L.S.
Dr. J. R. CURRIE, B.A. (Oxon)
Mr. J. DAY
Mr. J. LYON DENSON
Dr. GRANGER
Dr. RANDELL JACKSON, M.Sc.
Mr. A. E. LOVELL, M.A.
Prof. R. NEWSTEAD, M.Sc., A.L.S., F.E.S.
Mr. P. H. OKELL
Dr. JAMES TAYLOR

## Hon. Auditors:

Mr. BERESFORD ADAMS
Mr. E. NOEL HUMPHREYS, F.C.A.

## Curator:

Mr. ALFRED NEWSTEAD, *The Grosvenor Museum*

## Assistant Secretary:

Mr. W. J. NEW

## Representatives of the Society upon the Grosvenor Museum Management Committee:

Mr. J. BAIRSTOW, F.C.S.
Rev. J. L. BEDFORD, M.A., F.L.S.
Mr. F. W. LONGBOTTOM, F.R.A.S.
Mr. GEORGE P. MILN
Mr. J. D. SIDDALL
Mr. JOHN SIMON

THIRTY-EIGHTH

# ANNUAL REPORT.

YOUR Committee have much pleasure in reporting that, in spite of an unusually large loss through deaths and removals during the past year, the list of Members continues to be well above that which we have come to regard as its normal strength.

During the Summer months Excursions and Field Meetings were held as follows:—

## EXCURSIONS AND FIELD MEETINGS.

1908.

April 22nd—Delamere Forest and Meres.

„ 29th—Gresford Woods and Church.

May 9th—Natural History Ramble to Saughall, for Junior Members.

„ 27th—The Ancient Forest-beds at Meols, *via* West Kirby.

June 3rd—Evening Excursion to Backford, which included a visit to Backford Church.

„ 17th—Annual Excursion to Caerwys, Whitford, and Holywell, including the Earl of Denbigh's Fisheries and Water-plant Nurseries at Ysceifiog and Downing, and a visit to Downing Hall (by kind invitation of Sir Wm. Tate, Bart.).

„ 24th—Barnston Dale and the Private Woods (by kind permission of J. A. Milner, Esq., B.A., and Mr. E. Bennett).

„ 27th—An Invitation having been given by the Committee of the Liverpool Botanical Society to the Members of this Society to join an Excursion to Rossett and Gresford; some nine Members participated in this, which proved a successful Joint Excursion.

July 1st—Natural History Ramble, Sealand Road, Ferry Lane, and Navigation Cop.

„ 8th—Wepre Gardens and Woods (by kind permission of J. Rowden Freme, Esq., J.P.). This Excursion was POSTPONED *sine die* owing to wet weather.

„ 15th—Delamere, for Atchmere and Blakemere.

„ 29th—The Grosvenor Park, Chester.

1908.

Sept. 9th Saighton Grange, for the House and Gardens (by kind permission of The Countess Grosvenor), and to Bruera Church.

„ 23rd—Evening Meeting at the Grosvenor Museum, to inspect the Collections of British Plants in bloom, as well as the Society's Zoological, Entomological, and Geological Collections, which were described by MR. ROBERT NEWSTEAD, MR. A. W. LUCAS, MR. J. ARKLE, MR. J. THOMPSON, MR. F. SIMPSON, and the CURATOR (MR. ALFRED NEWSTEAD).

In their last Report, the Committee appealed for more interest in, and a larger attendance at these Excursions. They are glad to report that in several cases there was considerable improvement, and that a larger number of Members availed themselves of these opportunities. The Annual Excursion in particular, to Caerwys, Whitford, and Holywell (which included a visit to the Earl of Denbigh's Fisheries, &c., and to Downing Hall), was well attended, and in spite of very unfavourable weather, was much enjoyed.

Many of the shorter Excursions give very favourable opportunities to younger Members for the study of the local Birds, Insects, and Plants, under the guidance of practical Field Naturalists, and of the Society's Curator; and the Committee would once more express a hope that these may be more numerously attended. The Officers of the Society will be very glad to receive suggestions whereby these Excursions and Walks may be made more convenient and helpful to Members.

The following is a complete list of the General and Sectional Meetings held during the Autumn and Winter Session :—

## GENERAL MEETINGS.

1908.

Oct. 8th—Annual Conversazione in the Town Hall.

„ 13th to 24th—The large and interesting Collection of Local Fungi, exhibited at the Conversazione by MR. JOSEPH THOMPSON, was on view in the Art Gallery of the Museum, from Tuesday, October 13th, until Saturday, October 24th. This Collection, which comprised over 100 species and varieties, all correctly named, was quite unique.

„ 22nd—"The Queen's Country."—MISS B. E. CLAY, B.A. (The Queen's School).

Illustrated by a series of Lantern Slides.

GENERAL MEETINGS—*continued.*

1908.

Nov. 5th—"The part Insects play in the transmission of Disease."—SIR RUBERT BOYCE, F.R.S. (Dean of the University of Liverpool).

Illustrated by Lantern Slides.

Dec. 3rd—"Mendelism, or the Study of Heredity, by the Experimental Method."—DR. H. DRINKWATER, F.R.S. (Edin.), (of Wrexham).

Illustrated by Diagrams, Specimens, and Lantern Slides.

1909.

Jan 7th—"The British Association Meetings, Dublin 1908—the Men and the Methods."—MR. W. E. PLUMMER, M.A., F.R.A.S. (of Bidston Observatory).

Feb. 4th—"Fables."—MR. A. E. LOVELL, M.A.

Mar. 4th—"Jamaica; its Scenery and its Natural History."—PROFESSOR ROBERT NEWSTEAD, M.Sc., A.L.S., &c. (University of Liverpool).

Illustrated by a large number of specially prepared Lantern Slides, and Specimens of some of the characteristic Plants and Animals, made and collected during the recent Expedition sent out by the Liverpool School of Tropical Medicine.

April 1st—"Jupiter, the Giant Planet."—MR. F. W. LONGBOTTOM, F.R.A.S. (by special request).

Illustrated with some recent Lantern Slides.

,, 15th—Grosvenor Museum—PROFESSOR ROBT. NEWSTEAD, MR. FRANK SIMPSON, and THE CURATOR (MR. A. NEWSTEAD), explained the various objects of interest in the Museum.

The Collection of Plants recently presented by MISS HARRIS was also on view.

,, 22nd—"Northern India; Temples, Palaces, and Slums."—MR. DUDLEY H. ILLINGWORTH, M.Sc.

Illustrated by Lantern Slides.

*Special Afternoon Lectures, for Members and Junior Members of the Society and young people in general.*

1909.

Feb. 3rd—"The Queen's Country" (repeated, by special request).—MISS BEATRICE CLAY, B.A.

Illustrated by a series of Lantern Slides.

,, 17th—"Some Queer Things in the Sky."—MR. F. W. LONGBOTTOM F.R.A.S.

Illustrated by Lantern Slides, &c.

1908.

Dec. 3rd to 16th—Exhibition of the Kingsley Memorial Nature Study Prize Competitions, in the Art Gallery. There was also on exhibition in the Art Gallery, during the same period, the beautiful set of Coloured Studies of Wild Flowers (natural size), drawn from actual specimens by DR. H. DRINKWATER, F.R.S. (Edin.), Wrexham.

# SECTIONAL MEETINGS.

## BOTANICAL SECTION.

1908.

Oct. 29th—"The Trees of Lancashire, Cheshire, and North Wales."—MR. ARTHUR A. DALLMAN, F.C.S.

Illustrated by about 100 Lantern Slides by the Lecturer.

## ZOOLOGICAL SECTION.

1909.

Jan. 14th—Zoological Notes and Observations on the past year, contributed by the following Members:—THE CHAIRMAN (DR. W. H. DOBIE, MR. J. ARKLE, DR. JACKSON, MR. C. K. SIDDALL, MR. J. THOMPSON, THE CURATOR (MR. A. NEWSTEAD), and others.

A Specimen of the Schlegel's Petrel (new to the British Isles) was exhibited per the favour of MR. ARTHUR NEWSTEAD.

Notes on some new additions to the Society's Collections by THE CURATOR (MR. ALFRED NEWSTEAD), including Specimen of Crane presented by COL. T. J. LONG.

Several of the contributions were illustrated by Lantern Slides.

Mar. 25th—"Spiders and their ways."—MR. G. A. DUNLOP (Assistant Curator, Warrington Museum).

Illustrated by a series of Lantern Slides.

## GEOLOGICAL SECTION.

1909.

Jan. 21st—"Geological Formation of Flintshire."—MR. J. PHILIP JONES.

Illustrated by Geological Plans and Sections.

April 29th—"The Physical Geology of the British Coalfields."—MR. W. J. CLARKE.

Illustrated by Lantern Slides.

## NATURAL PHILOSOPHY SECTION.

1908.

Nov. 19th—"Electrons."—MR. J. BAIRSTOW, F.C.S.

1909.

Feb. 18th—"Modern Steam Power Developments."—MR. J. B. GOTT, A.M.I.Mech.E. (Sandycroft Foundry Company, Limited).

Illustrated by Lantern Slides.

## MICROSCOPICAL SECTION.

1909.

Jan. 28th—Demonstration of the processes of Cutting, Staining, and Mounting Sections of Tissues, and also the use of the Zeiss Projection Apparatus.—DR. ELLIOTT.

Exhibition and explanation of a new Special Trough and Lamp for the examination of Living Objects, and a new Lamp for General Microscopic Work.—MR. MICHAEL JOHNSON.

Exhibition and description of the structure and cell contents of the stem of *Anacharis*.—MR. J. D. SIDDALL.

## PHOTOGRAPHIC SECTION.

1908.

Nov. 26th – (By request) "A Walk round the City Walls," their origin and extent. "Old Gates and New": Towers—The Siege—Rowton Moor — The Roodee — General surroundings. — MR. FRANK SIMPSON.

Illustrated by 90 Lantern Slides, specially made for this Lecture.

Dec. 11th—"The New Southport Enlarging Table and Easel, and how to use it"; also "Bromide Enlargements, and how to make them."—MR. FRANK SIMPSON.

1909.

Jan. 29th—A Demonstration of Platino-type Printing—
MR. J. A. MCMICHAEL, B.A., B.SC.

Feb. 25th—"The Lake District." Lecture supplied by The Affiliation of Photographic Societies; illustrated by a large number of prize slides—MR. FRANK SIMPSON.

Mar. 19th—A Working Demonstration on the making of Enlarged Negatives from P. O. P. Prints—MR. W. ERNEST BROWN.

## LITERATURE SECTION.

1908.

Dec. 10th—"George Sand; her Life and Works"—
MISS C. STEINBERGER, B.A., Dr. ès litt. (Author of "William Dunbar").

1909.

Mar. 18th—"Dante"—MR. J. MENTEITH GRAHAM.

## ASTRONOMICAL SECTION.

1909.

Mar. 11th—"Maps, from an Astronomical point of view"—
MR. J. A. MCMICHAEL, B.A., B.SC.

Illustrated by Lantern Slides and Practical Demonstrations.

## ARTS AND CRAFTS SECTION.

1909.

Feb. 11th—A Special Meeting, presided over by THE VERY REV. DEAN DARBY, was held with the object of re-forming this Section. After an eloquent Address by the Chairman, a discussion ensued on the objects and aims of the Section, and eventually the following were elected to serve as a Council to arrange for Lectures and Exhibitions of Work: MISS G. M. SIDDALL, MESSRS. A C PRESTON, WALMSLEY PRICE, R. J. ELLIS, C. H. MINSHULL, T. A. WILLIAMS, F. W. LONGBOTTOM, S. MARSTON, and F. A. SHURROCK, with MR. HORACE DAVIES as Hon. Secretary.

April 5th to 19th—Fourteen days' Exhibition in the Art Gallery of a Collection of Water-colour Drawings, by the late DR. J. SAVAGE, Royal Artillery, and kindly lent by COLONEL

ARTS AND CRAFTS SECTION—*continued.*

SAVAGE, Curzon Park, to the Museum Management Committee.

The Collection comprised Sketches made at Gibraltar, Corfu, Dover, and many other places noted amongst Artists, and covered a period of some forty years from 1840.

The attendance at these Meetings continues to improve, and has been, with only two or three exceptions, very satisfactory. A glance at the list will shew the great variety of subjects dealt with, and the high level which has been maintained in the Lectures and Papers. The Committee feel that the Society owes a considerable debt to those Members who have helped in this part of the work, either by Lecturing themselves, or by securing the services of other competent persons. They feel that the quality of the Lectures has been steadily rising during the last few years; this is probably quite as much an effect as a cause of the improved attendance.

## MUSEUM AND EXHIBITS.

The increasing interest in the Society's Museum and Exhibits, noticed in the last Report, continues to shew itself. The number of Junior Members has again increased. The Exhibits continue to be used by Teachers of the City in their work; Lectures are given specially to children, by the Curator and others. The competition for the Kingsley Junior Prizes was the best so far recorded.

The Exhibition of Wild Flowers, named and classified, is very attractive, and has been well contributed to and inspected.

The local Birds in the Society's Museum continue to attract observers. In these, and many other ways, the work done in the past by the pioneers of the Society is bearing its fruit.

A special feature of the year was the presentation to the Hon. Scientific Secretary, the Rev. A. H. Fish, on the occasion of his marriage, of a valuable Silver Tray and Flower Stand, by the Officers and Members of the Society.

It is with very great regret that the Committee hear of the resignation by Mr. Fish, in consequence of his removal

from Chester, of the offices which he had held in connection with the Society. They wish to record here their sense of the many services which he has rendered to the Society during the last twenty-five years.

## LEGACIES AND DONATIONS.

The Society has received, under the Will of the late Mrs. Churton, who left a thousand pounds to the Grosvenor Museum, the sum of £250 as their share in the allocation of this legacy. It is proposed to invest this money, and to use the Interest in providing prizes similar to those of the Kingsley Memorial Fund.

Dr. James Taylor, F.R.C.S., has given to the Society a valuable Astronomical Telescope, for which the Committee desire here to record their hearty thanks. This Instrument, and that left by Dr. Stolterfoth, are now in order, and may, under certain conditions and rules, be borrowed by Members of the Society.

## TRANSFER TO THE COUNCIL.

The negotiations for the transfer of the Grosvenor Museum building to the City are now complete, and will be carried into effect at a very early date.

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The Membership of the Society is as follows :—

| | | | |
|---|---|---|---|
| Honorary Members | .. | .. | 22 |
| Corresponding ,, | .. | .. | 28 |
| Ordinary ,, | .. | .. | 886 |
| Junior ,, | .. | .. | 78 |
| Total .. | .. | .. | 1,014 |

Your Committee have met 12 times during the past year for the transaction of business, and the attendance at these Meetings has been equal to the average of past years.

A. H. FISH, B.A., B.Sc.,
*Hon. Scientific Secretary.*

G. P. MILN,
F. SIMPSON,
*Hon. Gen. Secretaries.*

GROSVENOR MUSEUM,
MAY 13th, 1909.

# FAREWELL DINNER

TO

# THE REV. A. H. FISH, B.A., B.Sc.

On Monday, June 7th, the Members of the Management Committee of the Grosvenor Museum, the Officers and Members of the Committee of our own Society, and also of the Archæological Society, and the Schools, entertained the Rev. A. H. Fish, B.A., B.Sc., to Dinner at the Grosvenor Hotel, on the eve of his departure for Clifton.

Mr. G. R. Griffith, J.P. (Chairman of the Management Committee), presided over a large company.

The speakers were The Chairman, Mr. G. P. Miln (President of our Society), Mr. J. D. Siddall, Mr. F. W. Longbottom, The Rev. Canon Spurling, and Mr. John Dodd, who kindly undertook all the arrangements.

Replying to the toast of the evening, proposed in felicitous terms by The Chairman, Mr. Fish referred in feeling words to his early connection with the Natural Science Society; to the many memories associated with it; and to the influence which it had exerted upon his own life.

More than any other Institution, the Natural Science Society had been for him the *Alma Mater*, which had nursed and quickened whatever was best in him. In all ways he remained and should always remain the Society's debtor and servant.

The life of the Archæological Society was assured. The life of their native City appealed not only to their interest, but also to their affections.

The interest of the Natural Science Society was pledged not only to the past, but also to the future. Science was the most rapidly growing power the world had ever seen; but she was still very young. Vast fields of discovery and enterprise still lay before her. Very, very few could directly be explorers in those fields. The future of the Society depended largely upon their power to encourage, to cherish, and to develop whatever germs of scientific ability might arise among them; and to provide a congenial soil in which these might grow. Science had done much; it would do more. It would not only put power over the material universe—as yet undreamed of—into the hands of man, but it would in the end point the way to the solution of those most difficult questions of the moral and social life of man, which had come down unsolved from generation to generation.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1909.

| Dr. | £ s. d. | £ s. d. |
|---|---|---|
| By 829 Subscriptions for year 1908-9 at 5/- ... ... | 207 5 0 | |
| ,, 10 Arrears ,, 1907-8 at 5/- ... ... | 2 10 0 | |
| ,, 2 ,, ,, 1906-7 at 5/- ... ... | 0 10 0 | |
| | | 210 5 0 |
| ,, 67 Junior Subscriptions for 1908-9 at 2/6 ... ... | 8 7 6 | |
| ,, 1 ,, Arrears for 1907-8 at 2/6 ... ... | 0 2 6 | |
| | | 8 10 0 |
| Subscriptions unpaid— | | |
| 46 for 1908-9 at 5/- ... ... £11 10 0 | | |
| 7 Juniors for 1908-9 at 2/6 ... 0 17 6 | | |
| ,, Gross Receipts from Excursions— | | |
| Delamere Forest and Meres ... ... | — | |
| Gresford Woods ... ... ... ... | — | |
| West Kirby and Meols ... ... ... | 2 16 6 | |
| Backford, near Chester ... ... ... | — | |
| Caerwys, Whitford, and Holywell (Annual Excursion) ... ... ... | 12 1 9 | |
| Barnston Dale ... ... ... ... | 2 2 3 | |
| Delamere for Atchmere and Blakemere ... | 0 15 2 | |
| Saighton Grange ... ... ... ... | 13 14 0 | |
| | | 31 9 8 |
| ,, Gross Receipts from Conversazione... ... ... | | 13 16 7 |
| ,, ,, ,, Lectures and Sectional Meetings | | 9 8 0 |
| ,, Donation from Mr. Shone towards cost of Skull of Ox (*Bos primigenius*. ... ... ... ... | | 0 10 0 |
| ,, Transferred from "J. Eyton Williams" Fund for Lectures expenses ... ... ... ... | | 20 0 0 |
| | | 293 19 3 |
| Balance to next Account ... | | 8 1 6½ |
| | | £302 0 9½ |

| Cr. | £ s. d. | £ s. d. |
|---|---|---|
| To Balance from last year ... ... ... ... | | 20 13 11 |
| ,, Museum Management Committee ... ... | | 75 0 0 |
| ,, Natural History Museum and Library ... ... | | 24 3 0 |
| ,, Postages ... ... ... ... ... ... | | 29 17 11½ |
| ,, Printing, Stationery, and Advertising ... ... | | 63 18 6 |
| ,, Expenses in connection with Excursions :— | | |
| West Kirby and Meols ... ... ... | 2 4 7 | |
| Caerwys, Whitford, and Holywell (Annual Excursion) ... ... ... ... | 11 11 3 | |
| Barnston Dale ... ... ... ... | 2 2 3 | |
| Delamere, for Atchmere and Blakemere ... | 0 15 2 | |
| Saighton Grange ... ... ... ... | 11 9 9 | |
| | | 28 3 0 |
| ,, Expenses in connection with Lectures, Evening Meetings, &c. :— | | |
| Conversazione ... ... ... ... | | 20 14 8 |
| Fees to Lecturers ... ... ... ... | | 4 9 9 |
| ,, Salary to Assistant Secretary ... ... | | 15 0 0 |
| ,, Honorarium to Assistant Curator ... ... | | 5 0 0 |
| ,, Subscriptions :— | | |
| Ray Society... ... ... ... ... | 1 1 0 | |
| Royal Photographic Society ... ... | 1 1 0 | |
| Palæontographical Society ... ... ... | 1 1 0 | |
| | | 3 3 0 |
| ,, Lantern Account ... ... ... ... ... | | 10 3 6 |
| ,, Collecting Outstanding Subscriptions ... ... | | 1 10 0 |
| ,, Bank Interest ... ... ... ... ... | | 0 3 6 |
| | | £302 0 9½ |

Examined with the Accounts and Vouchers relating thereto and found to be correct, showing a balance due to the Hon. Treasurer of £8 1s. 6½d.

BERESFORD ADAMS,
E. NOEL HUMPHREYS, F.C.A., } Hon. Auditors.

CHESTER, 4TH MAY, 1909.

JOHN SIMON, Hon. Treasurer.

## LEGACIES ACCOUNT.

**Dr.** The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art **Cr.**

| 1909. | £ s. d. |
|---|---|
| May 4th—Transferred to Current Account by sanction of Committee towards Lectures expenses ... ... | 20 0 0 |
| Balance ... ... ... ... ... | 500 10 4 |
| | £520 10 4 |

| | £ s. d. |
|---|---|
| 1906 (Nov. 24th) and 1908. | |
| Nov. 13th—Legacy bequeathed by the late Mr. John Eyton-Williams (received in two instalments) ... ... | 250 0 0 |
| Interest from 15th July, 1906, allowed on deferred payment (£8 16s. 2d., *less* Income Tax 8/9) ... | 8 7 5 |
| | 258 7 5 |
| 1909. | |
| April 8th—Legacy bequeathed by the late Mrs. George Churton... | 250 0 0 |
| | 508 7 5 |
| Bank Interest ... ... ... | 12 2 11 |
| | £520 10 4 |
| 1909. | |
| May 5th—Balance in Bank .. ... ... ... ... | £500 10 4 |

May 5th, 1909—Examined and found correct,

JOHN SIMON, HON. TREASURER.

BERESFORD ADAMS,
E. NOEL HUMPHREYS, F.C.A., } HON. AUDITORS.

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## "KINGSLEY MEMORIAL" FUND.

### Statement of Accounts for the Year ended 30th April, 1909.

| 1908-9. | £ s. d. |
|---|---|
| To Balance from last Account ... ... ... ... ... | 11 3 3 |
| ,, Dividends on Great Western Railway Consolidated Ordinary Stock ... ... ... ... ... ... ... | 14 19 3 |
| | £26 2 6 |
| To Balance in Bank ... ... ... ... ... ... | £5 8 7 |

| 1908-9. | £ s. d. |
|---|---|
| By Prizes awarded as follows :— | |
| Mr. H. A. Hatch, M.Sc. ... ... ... ... ... | 3 3 0 |
| Miss Humphry-Williams ... ... ... ... ... | 2 2 0 |
| Mr. J. A. S. Stendall ... ... ... ... ... | 2 2 0 |
| Mr. G. A. Dunlop... ... ... ... ... ... | 1 1 0 |
| Mr. C. K. Siddall... ... ... ... ... ... | 1 1 0 |
| ,, Amount paid for Junior Prizes ... ... ... ... | 7 18 6 |
| ,, Printing Account ... ... ... ... ... ... | 0 14 0 |
| ,, Account for Certificates of Merit ... ... ... ... | 2 10 5 |
| ,, Engraving Medal for 1908 ... ... ... ... ... | 0 2 0 |
| Balance ... ... ... ... ... ... | 5 8 7 |
| | £26 2 6 |

3rd May, 1909—Examined and found correct,

GEORGE P. MILN, HON. TREASURER.

J. THOMPSON, AUDITOR.

# CURATOR AND LIBRARIAN'S REPORT.

YOUR Curator has much pleasure in presenting his Annual Report on the additions to the Society's Library and Museum, of which the following are worthy of special comment :—

MISS HARRIS has very kindly presented to the Society her late Father's "Herbarium," consisting, approximately, of 1,049 specimens of British Plants.

A specimen of the Common Crane *(Grus communis)*, procured by the Gamekeeper on the estate of Colonel T. J. Long, on the 16th May, 1908, at Rhosneigr, Anglesea. This is a new record to the *Avi-fauna* of North Wales, and COLONEL LONG has very generously presented the specimen to the Society's Museum, where it is highly valued, and forms an extremely valuable addition to the local collections preserved in this Institution. The plumage and feet of the bird are in most perfect condition, and there is no indication that it had been in captivity. Judging from the colour of the plumage, it had not quite reached maturity; the red wattles on the head were well marked. The measurements were as follows:—Length 44 inches; wing 21 inches; tarsus $8\frac{3}{4}$ inches, weight 11 pounds. Dr. W. H. Dobie writes—"The tenth example recorded for the British Isles since 1888; of these the greater number are chiefly from the East Coast."

COUNCILLOR R. T. WICKHAM has kindly presented a specimen of the Ruff *(Machetes pugnax)*, shot by the Donor on the Gowy Meadows, Cheshire, September 30th, 1908. A few of these interesting birds occur every year, more or less, in the West of the County of Cheshire, during the Autumn and Spring migration.

An addition worthy of special mention is a specimen of the Gadwall *(Chaulelasmus streperus)*, the gift of MR. L. P. SMITH of Blacon. The first example of this rare visitor, recorded for Cheshire, was shot at Burton, March 13th, 1845, and presented by CAPTAIN CONGREVE, V.C.

The Society are fortunate in obtaining a very fine skull of the extinct European Wild Ox *(Bos primigenius)*; found during dredging operations in the Runcorn section of the Ship Canal in 1907, at a depth of about 20 feet in an alluvial deposit. The thanks of the Society are due to MR. W. SHONE for kindly contributing towards the purchase of this valuable and interesting addition, and to MESSRS. F. W. HUTTON and R. NEWSTEAD for bringing the matter before the Society.

MESSRS. J. R. LE B. TOMLIN, J. ARKLE, G. ARNOLD, R. NEWSTEAD, and the CURATOR, have added several new and rare additions to the collections of Mollusca and Insecta.

A specimen of the Lesser Shrew is worthy of mention.

The total number of additions is 1,557, representing 90 species; the latter figures do not include the number of species contained in the "Herbarium" collected by the late Rev. James Harris.

It may be of interest to the Members of the Society to include in this Report the following abstract from the Report to the Board of Education on the "Return of Visitors to the Museum":—From January to December (inclusive) 1908, the total number of Visitors, including Students attending the Day and Evening Science and Art Schools, the various Societies, Field Clubs, Schools (resident and non-resident), is, approximately, 45,348; of this total 2,618 have paid for admission, the entrance fees amounting to £32 14s. 6d.

By invitation of the Museum Management Committee arrangements have again been made for a series of "Nature-Study Lessons," on six subjects, commencing April 19th, ending on or about September 16th, 1909, to Classes of the City Public Elementary Schools, given by the Curator.

The subjects approved by the Director of Education are as follows:—

(1) The Stone and Bronze Age
(2) Fossils, and how they are formed
(3) Corals and Sponges
(4) The Rook, Raven, and Crow
(5) The Star-fish and Sea-urchin
(6) Common Flowering Plants.

The total number of attendances, at an average weekly attendance of 70, is 1,260. Specimens in the Society's Museum, lantern photographs, and living specimens, are used to illustrate the lessons.

## ADDITIONS TO THE SOCIETY'S MUSEUM.

MR. J. ARKLE—1 species, 3 specimens *Lepidoptera.*

MR. T. A. COWARD—Hawfinch; Lesser Redpoll; series of eight *Geotrupes typhæus.*

CURATOR—1 *Araneus diadema*; 1 Lesser Shrew *(Sorex pygmæus)*; 1 Goldfinch *(Carduelis elegans)*; 13 species, 26 specimens of *Lepidoptera*; 15 species of *Hemiptera, Homoptera.*

MR. W. T. DAVIES—Nest of *Vespa Britannica.*

MR. W. G. EDWARDS—Larva of *Cossus ligniperda.*

SIR PHILIP GREY EGERTON, BART.—*Stigmaria ficoides.*

MR. E. M. JONES—*Araneus diadema.*

MISS G. E. L. JOHNSON—Wood Sphinx *(Œschna juncea).*

COLONEL T. J. LONG—Common Crane *(Grus communis).*

MR. J. LUNE—Deaths-head Moth *(Acherontia atropos).*

PROF. R. NEWSTEAD—5 species, 13 specimens, *Hymenoptera.*

MR. FRANK ROBERTS—Eyed-hawk Moth *(Saturnii carpini)*.

MR. C. K. SIDDALL—Nest and three eggs of Greenfinch in Spruce Branch.

MR. L. P. SMITH—Gadwall *(Chaulelasmus streperus)*.

MR. A. R. SMITH—Albino Sparrow.

MR. J. THOMPSON—1 species, 10 specimens, *Coleoptera*.

MR. J. K. LE B. TOMLIN—2 species, 5 specimens, *Coleoptera*.

" —32 " 398 " *Mollusca*.

COUNCILLOR R. T. WICKHAM—Ruff *(Machetes pugnax)*.

MR. J. WILLIAMS—2 *Falco peregrinus*.

MR. YOUDE—Merlin Hawk *(Falco æsalon)*.

Purchased—Skull of extinct European Wild Ox *(Bos primigenius)*.

MISS HARRIS—"Herbarium" of, approximately, 1,049 specimens of British Plants, collected by the late Rev. James Harris.

DR. W. H. DOBIE—Framed Photogravures of the late Prof. Alfred Newton, and the late Mr. Howard Saunders, F.L.S.

DR. JAMES TAYLOR—Refracting Telescope, by A. Goiffier, Paris; Object-glass, $3\frac{3}{8}$ inch aperture; 1 Day Eye-piece; 2 Astronomical Eye-pieces; 2 Dark Sun-caps; Finder; Steadying-rod; Tall adjustable Alt-Azimuth Stand; Travelling Case.

## ADDITIONS TO THE SOCIETY'S LIBRARY 1908-1909.

(Marked * are by exchange).

*Ashmolean Natural History Society of Oxfordshire, Historical Account of; F. A. Bellamy, 1880-1895.

*Brooklyn Institute of Arts and Science—
"Fresh-water Cyclops of Long Island," March 1909.

Brighton and Hove Natural History and Philosophical Society, Annual Report, 1907-1908.

Bristol Museum and Art Gallery, Report of, 1908.

*Bristol Naturalists' Society, Proceedings of, Vol. II., Part 1, 1908.

*British Association, Report of the Corresponding Societies, Committees, and Conference of Delegates, Leicester and Dublin Meeting, 1907-1908.

*British Museum (Natural History)—
Guide to the Gallery of Fishes.
" Specimens of the Horse Family *(Equidæ)*.
" Elephants (Recent and Fossil).
" Specimens illustrating the Races of Mankind *(Anthropology)*.
" Exhibited Series of Insects.
" Domesticated Animals (other than horses).
" Whales, Porpoises, and Dolphins *(Cetacea)*.
Introduction to the Study of Rocks.

*Bidston Observatory, Report of Director of, 1908.

*Cardiff Naturalists' Society, Transactions, Vol. XL., 1907.

Cardiff Museum Report, Year ending March 1908.

Conchology, Elements of; Rev. E. I. Burrows, 1844. *Donor*, Mr. Chas. Oldham.

Colchester, Report of Museum and Muniment Committee, 1908-1909.

*Colorado Studies, University of, Vol. V., No. 3, 1908.

,, ,, Vol. VI., No. 2., 1908.

Chemical Industry, Journal of Society of, 1903-1907. *Donor*, Mr. E. G. Ballard.

Chemical Society, Journal of, Parts 1-12, 1908. January-April 1909. *Donor*, Mr. W. F. J. Shepheard.

Cheshire Land and Fresh-water Mollusca, Notes on; Chas. Oldham (Reprint from "Naturalist"), 1908. *Donor*, The Author.

Chester Society of Natural Science, Literature, and Art, 37th Annual Report, 1907-1908.

Chester Society of Natural Science, Literature, and Art, Proceedings of, No. 2, 1878. *Donor*, Mr. F. A. Walker.

Derwent Naturalists' Field Club, Vale of, Transactions of, Vol. I., Part 1, New Series. *Donor*, Dr. R. Jackson.

Detroit Museum of Art, Annual Report, 1908.

Dorset Natural History and Antiquarian Field Club, Proceedings of, Vols. XXVIII. and XXIX. *Donor*, Mr. Thos. Shepheard.

Dublin Museum of Science and Art, General Guide, 1908; "Japanese Pottery and Porcelain," S. D. Westropp, 1907; "Greek and Roman Pottery," C. Gutch, 1908.

*Ealing Scientific and Microscopical Society, Report and Transactions, 1907-1908.

"Entomologist," 1908. By purchase.

Ferns and their Allies, Analysis of the British, 1837. *Donor*, Mr. Chas. Oldham.

Flora, English; Sir J. E. Smith, Vols. I. to IV., 1824. *Donor*, Mr. Chas. Oldham.

*Geologists' Association, Proceedings of, Vol. XX., Part 6, 1908.

"Geographical Journal," 1908. By purchase.

Glasgow, Report of Museum and Art Galleries, 1908.

*Glasgow Natural History Society, Transactions, Vol. VIII., Part 1, 1905-1906.

Godlee Observatory, Third Annual Report, 1907.

Horniman Museum and Library, Sixth Annual Report, 1907.

Hull Museum Publications, 1908-1909; Thos. Sheppard (Curator).

*Hull Scientific and Field Naturalists' Club, Transactions of, Vol. I., No. 1, 1898.

Ipswich Museum and Free Library, Financial Report, 1908.

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ALFRED NEWSTEAD,
*Curator and Librarian.*

MAY 13th, 1909.

# KINGSLEY MEMORIAL PRIZES

ARE OFFERED UNDER THE FOLLOWING CONDITIONS:—

## CLASS I.

**To any Resident in the Society's District.**—A Prize not exceeding **Ten Pounds** for the best Collection of Objects, or Essays, or Notes of Observations, or Photographs illustrating the Natural Science of the Society's District.

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the Competitors.

Collections, or Essays, or Notes, must be sent to the General Secretaries on or before September 1st, and the awards will be made at the Conversazione next succeeding.

The Committee have the option of retaining successful Collections, &c., for the Society.

## CLASS II.

**In order to encourage the study of Natural History among younger Students, not exceeding 17 years of age, and residing in the Society's District, *i.e.*, Cheshire and North Wales, the following Prizes and Certificates are offered, viz.:—**

**The FIRST PRIZE in each Class will be HALF-A-GUINEA, together with the Society's Certificate.**

**Collections, Essays, or Photographs not gaining a Prize, may be awarded Certificates if found to be of sufficient merit.**

1.—For the best collection of twenty Dry Fruits of Native Plants, named, and grouped in such a way as to show their different modes of dispersal, with Notes thereon.

2.—For the best descriptions of six Climbing Plants growing in hedge-rows, with Drawings illustrative of their methods of climbing.

3.—For the best Notes and Observations on the Habits and Life-History of the Titmice *(Paridæ)*.

4.—For the best account of the Life-History of the Common Frog.

5.—For the best Notes of Observations on the River Dee; either above or below the Weir.

6.—For the four best Photographs of Natural Objects, such as: Birds, Trees, Flowers, Rocks, Clouds; or Scenery of Cheshire or North Wales.

7.—For the best Working Model of a Sun-Dial.

8. For the best Drawings of the shape of the Moon, made on every day of the month (as often as clouds will allow) accompanied by Notes, stating time of rising, time when the Drawing was made, region of sky in which the Moon was seen, and any conclusions which may be drawn from these observations.

CONDITIONS.—All the actual work must be done entirely by the Competitors, who must be under 17 years of age. Of course, assistance and instruction from Teachers and Books is permissible and desirable, but mere copied or dictated Essays will be disqualified. The Essays and Collections should be sent under a *nom de plume*, accompanied by a sealed letter containing the full name and exact age of the Competitor, to the Hon. Secretaries, on or before September 1st, 1909, free of any charge.

The Collections, Specimens, &c., will be exhibited in the Grosvenor Museum after the awards have been made, due notice of which will be sent to each Competitor. No Competitor will be allowed to take more than two Prizes or Certificates.

The awards will be made at the Society's Conversazione next succeeding the adjudication.

The Committee do not bind themselves to give the full Prize in case of insufficient merit.

Any further information required can be had on application to the Hon. Secretaries.

# KINGSLEY MEMORIAL MEDAL

ESTABLISHED 1877,

*"For having contributed materially to the promotion and advancement of some branch or department of Natural Science."—Vide* TRUST DEED.

1877—MRS. CHAS. KINGSLEY (In Memoriam).
1878—JOHN PRICE, M.A.
1879—SIR PHILIP DE MALPAS GREY-EGERTON BART., F.R.S.
1880—PROF. T. MCKENNY HUGHES, F.R.S.
1881—D. MACKINTOSH, F.G.S.
1882—ISAAC BYERLEY, M.R.C.S., F.L.S.
1883—GEORGE W. SHRUBSOLE, F.G.S.
1884—ALFRED OSTEN WALKER, F.L.S.
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1889—THOMAS RUDDY.
1890—REV. CHARLES WOLLEY-DOD, M.A.
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1894—W. MURRAY DOBIE, M.D., F.R.A S.
1896—REV. ARTHUR H. FISH, B.A., B.SC.
1897—WILLIAM HENRY DOBIE, M.B.
1899—W. F. LOWE, A.R.S.M., F.I.C., F.C.S.
1900—JOSEPH ARKLE.
1901—THOMAS ALFRED COWARD.
1902—CHARLES OLDHAM.
1903—GEORGE P. MILN.
1904—GEORGE O. DAY, F.E.S.
1905—C. THEODORE GREEN, M.R.C.S., L.R.C.P., F.L.S., &C.
1906—FREDERICK WILLIAM LONGBOTTOM, F.R.A.S.
1907—REV. J. CAIRNS MITCHELL, B.D., F.R.A.S.
1908—ALFRED WALTER LUCAS, F.G.S.

# KINGSLEY MEMORIAL PRIZES

(OF £5 AND UPWARDS)

ESTABLISHED 1877,

*"For the reward, encouragement, and the advancement of the pursuit and study of Natural Science."—Vide* TRUST DEED.

| | | | |
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| 1878 | HELEN SMITH ..... £5<br>EDWIN W. OKELL ..... 5 | | *Herbarium of Flowering Plants.* |
| 1879 | GEORGE SHRUBSOLE ..... | 5 | *Carboniferous Fossils.* |
| 1881 | E. HOPKINS..... | 5 | *Cryptogamous Plants.* |
| 1882 | GEORGE SHRUBSOLE ..... | 10 | *Corals of the Mountain Limestone.* |
| 1886 | ROBERT NEWSTEAD ..... | 10 | *Hymenoptera.* |
| 1887 | JOHN LYON DENSON ..... | 5 | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888 | LILIAN E. TOMLIN..... | 5 | *Coleoptera.* |
| 1889 | EDITH C. TOMLIN ..... 5<br>W. E. SHARP ..... 5 | | *Diptera and Hymenoptera (Terebrantia).*<br>*Coleoptera.* |
| 1890 | ALFRED J. NIXON..... | 10 | *Land and Fresh-Water Shells.* |
| 1892 | W. E. SHARP ..... | 10 | *Coleoptera.* |
| 1896 | ALFRED NEWSTEAD...£5 5s. | | *Hydradephaga (Water Beetles) and Life Histories of Insects.* |
| 1897 | ALFRED NEWSTEAD ...£5 5s. | | *Life Histories of Insects.* |
| 1900 | MISS M. BOWERS ..... £5 | | *Collection of Botanical Specimens.* |
| 1901 | A. E. GOODMAN .....£5 5s. | | *Collection of Photo-Micrographs, with Notes and Observations.* |
| 1902 | C. THEODORE GREEN ...£10 | | *Collection of 148 Microscopical Preparations and 170 Herbarium Specimens of Micro-Fungi, together with a descriptive Catalogue and Essay on same.* |
| 1906 | HUGH H. THOMAS ...£8 8s. | | *Collection of Fossil Plants from the Lower and Middle Beds of the Coal Measures of Denbighshire, together with descriptive notes of same.* |

Amounts less than £5 are also awarded annually.

## LAST YEAR JUNIOR PRIZES AND CERTIFICATES WERE AWARDED AS FOLLOWS:—

*1. For the best account of the Life-History of the Silkworm, describing its mode of life and the method of rearing. Credit given for careful drawings of the various stages in its life, and for actual specimens of the Silk produced:—*

FRANCIS JOHN ARMSTRONG, Arnold House School, Chester ..... **First Prize and Certificate**
MONA MULLINS, Holt Hill Convent, Birkenhead ..... **Special Prize and Certificate**
FRANCES COYNE, ,, ,, ..... ,, ,,
HILDA DODD, ,, ,, ..... ,, ,,
EVELYNE GRANEY, ,, ,, ..... ,, ,,
SYDNEY BRAITHWAITE, Port Sunlight Senior School..... ,, ,,
MAGGIE WOODS, St. John's R.C. School, New Ferry..... **Certificate of Merit — Highly Commended**
ELLEN DUGGAN, ,, ,, ..... ,, ,,
LOUIS HEFFERNAN, ,, ,, ..... ,, ,,
CHARLES KAIN, ,, ,, ..... ,, ,,
HERBERT PARSONAGE, Ashton Hayes School, nr. Chester ,, ,,
ALBERT EGERTON LATHAM, Sandbach Grammar School ,, ,,
EDITH HAZLEHURST, Girls' School, Hoylake ..... **Certificate of Merit**
GLADYS CRIMES, Ashton Hayes School, near Chester ... ,, ,,
WALTER BRIDGE, ,, ,, ... ,, ,,
ANNIE LYLE, Higher Elementary School, Hale ..... ,, ,,
FRANK WALKER, Port Sunlight Senior School ..... ,, ,,
MAY WILLIAMS, St. Michael's Mixed School, Chester ... ,, ,,
CISSIE DAVIES, ,, ,, ... ,, ,,
LAURA WHITE, ,, ,, .. ,, ,,

*2. For the best descriptions, with drawings, of the development from the seed to the unfolding of the first foliage-leaf, of the following Plants: Horse Chestnut; Maize; Mustard (or Radish); Bean: Sycamore:—*

DOROTHY WALKER, Hunter Street Higher Grade School, Chester ..... **First Prize and Certificate**
HILDA MAUD BECKETT, ,, ,, **Special Prize and Certificate**
IRENE THOMAS, Dr. Williams' School, Dolgelley ..... ,, ,,
MARIE WILD, ,, ,, ..... ,, ,,
KATE R. DOLPHIN, Victoria Road School, Chester..... **Certificate of Merit**
PERCIVAL SYLVESTER, Astbury National School, near Congleton ..... ,, ,,
MADGE JAGO, Higher Elementary School, Hale, Altrincham ..... ,, ,,

*3. For the best descriptions and drawings of a twig and dissected bud of the following Trees: the Oak; Ash; Horse Chestnut; Beech; Sycamore; and Lilac. Some explanation should be given of the means by which bud-protection is effected in each case:—*

DOROTHY MADIN DAVIES, The Queen's School, Chester... **First Prize and Certificate**
SYLVIA THORNTON JONES, ,, ,, ... **Special Prize and Certificate**
ALLAN FOULKES, Port Sunlight Senior School..... ,, ,,
CHARLES THOMAS SMAIL, ,, ..... ,, ,,
CISSIE DAVIES, St. Michael's Mixed School, Chester..... ,, ,,
DORA HULME. The High School, Macclesfield..... ,, ,,
NELLIE WORTHINGTON, ,, ..... .. ,, ,,
DORA AGNES BAXTER, Christ Church School, Eaton, near Congleton ..... **Certificate of Merit**
WILLIAM SOLMAN, ,, ,, ,, ,,
HILDA SUTTON, The High School, Sale..... ,, ,,
DOROTHY CECIL BILLYARD, The High School, Alderley Edge ..... ,, ,,
HILDA DOMAKIN, ,, ,, ,, ,,
URSULA THOMAS, ,, ,, ,, ,,
GERTRUDE MARY HARRIS, ,, ,, ,, ,,
CLARA MILDRED HAWARTH ,, ,, ,, ,,
EVELYN WRIGHT, Appleton School, near Warrington .. ,, ,,
PERCIVAL SYLVESTER, Astbury National School, near Congleton ..... ,, ,,
LILIAN MAY WARWICK, Ashton Hayes School, nr. Chester ,, ,,

WALTER BRIDGE, Ashton Hayes School, nr. Chester.....**Certificate of Merit**
HERBERT PARSONAGE, „ „ „ „
JOSEPH BROADY, Higher Elementary School, Hale, Altrincham ..... „ „
HERBERT C. COX, „ „ „ „
KATE R. DOLPHIN, Victoria Road School, Chester..... „ „
AGNES LUNT, „ „ ..... „ „
MARTHA DODD, „ „ ..... „ „
ELSIE CHALLINOR, The High School, Macclesfield..... „ „
GEORGE NATHAN BIRD, Bromborough C. of E. School ... „ „

*4. No Competition.*

*5. For the best account of the Life-History of the Robin (Redbreast), Erithacus rubecula:—*

LIONEL E. HUMPHRY-WILLIAMS, King's School, Chester **First Prize and Certificate**
FRANCIS JOHN ARMSTRONG, Arnold House School, Chester ..... **Special Prize and Certificate**
WINIFRED POLKINGHORNE, Glanavon School, Chester... „ „
MARGARET ARMSTRONG, „ „ „ „ „ „
VIOLET MOSFORD, „ „ „ „ „ „
ANNIS ANNE TATLER, „ „ „ „ „ „
EVELYN MARGUERITE CAMM, „ „ „ „ „ „
A. CARDEN LOCKWOOD, Wirral House School, Chester...**Certificate of Merit—Highly Commended**
PERCY HODGSON, St. John's R.C. School, New Ferry ... „ „
CHRISTINE RAMSAY WATSON, Glanavon School, Chester „ „
DOLLIE KILLON, „ „ „ „ „ „
ANNIE DARLINGTON, „ „ „ „ „ „
HERMIONE ROBERTSON, „ „ „ „ „ „
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PHYLLIS BOREHAM, „ „ „ „ „ „
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WINIFREDE MARY WATSON, „ „ „ „ „ „
ELSIE ASTON, „ „ „ „ „ „
EVELYN MAUD BECK, „ „ „ „ „ „
PHYLLIS MAY ANDERSON, „ „ „ „ „ „
FRANCES JANE COOKSON, „ „ „ „ „ „
GLADYS CROWDER, „ „ „ „ „ „
JACK BOREHAM, „ „ „ „ „ „
CONNIE MILN, The Queen's School, Chester.....**Certificate of Merit**
ADA ELSIE HARRISON, Glanavon School, Chester ..... „ „
RICHARD WALTER GATE, Higher Elementary School, Altrincham ..... „ „
CHARLES WESTON, Port Sunlight Senior School..... „ „
HERBERT FOULKES, „ „ ..... „ „
GEORGE LEWIS ASTLE, Christ Church School, Eaton, near Congleton .. ..... „ „
ELLEN KENNY, St. John's R.C. School, New Ferry ..... „ „
GEOFFREY WM. WATSON, Wirral House School, Chester „ „
ELSIE BAYLEY, Henbury School, Macclesfield..... „ „
ADA PRIEST, „ „ ..... „ „
ANNIE COPPOCK, „ „ ..... „ „
ERNEST HORTON, „ „ ..... „ „
FRANK BOSTOCK, „ „ ..... „ „
GEORGE BARBER, „ „ ..... „ „
LILY WILTON, Castle, Northwich ..... „ „
J. GARNER, Aldersey Grammar School, Bunbury ..... „ „
EDGAR DUTTON, „ „ ..... „ „
J. ALLAN FLEET, „ „ ..... „ „
JOHN H. ALLWOOD, „ „ ..... „ „
DOROTHY CECIL BILLYARD, The High School, Alderley Edge ..... „ „

6. *For the best Notes on the appearance and habits of the three Common Gulls which are visitors to our district, viz. :—(1) The Black-headed Gull (Larus ridibundus); (2) the Common Gull (Larus canus); (3) the Herring Gull (Larus argentatus):—*

WILFRED NORMAN RIDDELL, King's School, Chester ...**First Prize and Certificate**
MICHAEL BOWE, St. John's R.C. School, New Ferry.....**Special Prize and Certificate**
ERIC VINCENT JEFFERIES, Wallasey Grammar School ...**Certificate of Merit**
JOSEPH W. WRIGHT, Aldersey Grammar School, Bunbury ,, ,,
NORMAN HINCE, ,, ,, ,, ,,
PERCY G. LEWIS, ,, ,, ,, ,,

7. *For the best four Photographs; any subject, but preferably those of scientific interest:—*

THOMAS A. WEAVER, Christleton, Chester .....**First Prize and Certificate**
J. DOUGLAS MILN, Arnold House School, Chester.....**Special Prize and Certificate**

8. *For the best descriptions of a piece each of the four following: (a) Clay; (b) Red Sandstone; (c) Chalk; (d) Coal:—*

MICHAEL BOWE, St. John's R.C. School, New Ferry.....**First Prize and Certificate**
MARGARET ARMSTRONG, Glanavon School, Chester .....**Special Prize and Certificate**

*Awards were also made to the following Junior Members, for having contributed specimens of Native Plants to the Exhibition held at the Grosvenor Museum during the summer months:—*

G. GORDON MILN, F. W. J. BELTON, and T. E. MILN.

# LIBRARY RULES.

1.—The Library will be open daily, except on Holidays, from 10 a.m. to 4 p.m.; and from 6 p.m. to 9-30 p.m. on the evenings when the Societies meet.

2.—As the Library is intended for purposes of study and reference, Members are expected to abstain from conversation which may be disturbing to other readers.

3.—Members are requested not to replace Books on the shelves, but to give them to the attendant for replacement.

4.—No Periodicals belonging to either Society are to be taken out of the Library.

5.—The Books belonging to the Archæological Society are intended as books of reference, and must not be taken away.

6.—Books belonging to the Society of Natural Science may, with certain exceptions, be taken out by Members of the Society, under the Rules of the Society. A receipt must be given to the Librarian for all Books so borrowed.

7.—Persons who are not Members of either Society, desiring to use the Library, must present a letter of introduction from a Member, endorsed by the Secretary, or President, of the particular Society whose Books they wish to consult; such order to be available for one week only.

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1871 to 1875 Rev. Charles Kingsley, Canon of Chester
*(Founder of the Society).*
1875 ,, 1891—Prof. T. McKenny Hughes, F.R.S.
1891-2 Alfred O. Walker, Esq., J.P., F.L.S.
1892-3 His Grace The Duke of Westminster, K.G.
1893 to 1895—W. Murray Dobie, Esq., M.D., J.P., F.R.A.S.
1895 ,, 1897—Henry Stolterfoth, Esq., M.A., M.D., J.P.
1897-8 Thomas Shepheard, Esq., F.R.M.S.
1898 to 1902 John D. Siddall, Esq.
1902 ,, 1906—Rev. Arthur H. Fish, B.A., B.Sc.
1906-7 Fredk. Wm. Longbottom, Esq., F.R.A.S.
1907 to 1909—Alexander Hamilton, Esq., F.R.C.S., &c., J.P.

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Barrow Naturalists' Field Club
Brighton and Sussex Natural History Society
Bristol Naturalists' Society
British Association (Corresponding Societies' Committee).
British Museum (Natural History), Cromwell Road, London, S.W.
Brooklyn Institute of Arts and Sciences, Brooklyn, N.Y.
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Liverpool Geological Society
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Liverpool Microscopical Society
Liverpool Naturalists' Field Club
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Liverpool Astronomical Society
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Manchester Geological and Mining Society
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Missouri Botanical Garden, St. Louis, U.S.A.
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Washington, University of, Seattle, Wn., U.S.A.
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Yorkshire Naturalists' Union, Leeds.

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*Those marked (*) have read or contributed Papers at the Society's Meetings.*

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Joachim, Mr. George ... . ..... .....*Dunedin, Otago, New Zealand*
Jones, Mr. R. J. Gresley ..... . ..... ..*School House, Bodafon, Llandudno*
*Jones, Mr. J. Philip ..... .....*Pendre, Holywell*
Nicholson, Mr. A. C., F.G.S. .....*14, Ferndale Road, Hoylake, Birkenhead*
Nixon, Mr. A. J. .....*Birdham School, Chichester*
*Oldham, Mr. C. .....*Essex House, Watford, Herts*
Perkins, Miss Steele ..... .....*Bryngwylad, Grange Road, Rhyl*
*Reade, Mr. Oswald A. .....*Haslar Naval Hospital, Portsmouth*
Roberts, Mr. J. W. ..... .....*High Street, Bala*
Rooper, Mr. F. E., F.G.S. .....*Bronydd, Glyn, Ruabon*
*Ruddy, Mr. Thomas .....*The Woodlands, Llangollen*
Russell, Dr. .....*Colwyn Bay*
Sopp, Mr. E. J. B., F.R.Met.S., F.E.S. ...*104, Liverpool Road, Birkdale*
Thompson, Mr. A. H. ..... .....*12, Salisbury Road, Bexley, Kent*
Tomlin, Mr. J. R. le B., M.A., F.E.S. .....*Stonely, Alexandra Road, Reading*
*Wilkins, Mr. T. S. .....*Uttoxeter*
Williams, Mr. G. J., F.G.S. .....*H.M. Inspector of Mines, Bangor*
*Williams, Prof. J. Lloyd, D.Sc. .....*University College of North Wales, Bangor*

# NOTICE.

☞ **THE ANNUAL SUBSCRIPTIONS are due on the 1st of May in each year. Members who have not paid for the present year are respectfully requested to forward the amount (Five Shillings) to the Hon. Treasurer, Mr. JOHN SIMON, Chemist, 4, Eastgate Row.**

*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their names are retained on the Society's Books, and their subscriptions considered due, until notice has been given to the contrary, according to Rule* 9.

# LIST OF MEMBERS.

*Those marked* (*) *have read or contributed Papers at the Society's Meetings.*

Abbott, Mr. H. A. .....The College, Chester
Acton, Mr. T. Arthur .....Wrexham
Acton, Mrs. .....3 Grove Road, Wrexham
Adair, Major-General .....7 Stanley place
Adams, Mr. Beresford .....Shirley House, Liverpool Road
Adams, Mrs. ..... " "
Adams, Miss Annie ..... " "
Adams, Mr. H. Dean ..... " "
Adams, Mr. Geo. F. .....Ashbourne, Victoria road
Adams, Miss Sissy ..... " "
Ainsworth, Miss F. .....4 Nicholas street
Aldersey, Miss Rose F. .....Bryn Field, 10 Brook Lane
Aldis, Mr. Osborne, M.A. .....14 Victoria Pathway, Queen's park
Allen, Miss .....Tarvin bridge
Almond, Mr. T. D. ..... .....Boughton P. O., Tarvin road
Alvey, Mr. Edward .....Ashton Hayes School
Anderson Mr. J. Leggett.....19 Brook lane
Andrew, Mr. John R. .....18 Bold square
Andrew, Miss R. ..... " "
Andrews, Miss Edith .....2 West view, Dee banks
Andrews, Miss Margaret..... " "
*Arkle, Mr. J. .....2 George street
Arkle, Mr. Henry ..... " "
Armstrong, Mr. Andrew W. ....Spring Villa, 22 Liverpool road
Armstrong, Mrs. ..... " "
Armstrong, Mrs. Frances.....62 Gladstone road
Ascroft, Mr. F. W. .....47 Nicholas street
Ascroft, Mrs. ..... " "
Aspey, Mrs. .....43 Foregate street
Atcherley, Mr. R. T. B. .....6 Stanley place
Atkin, Mr. Chas. .....72 Foregate street
Atkin, Mrs. ..... " "
Aves, Mr. J. W. .....171 Boughton
Ayrton, Mr. A. .....2 Chichester street
Ayrton, Mrs. ..... " "
Ayrton, Mr. Wm.....The Cliff, Beccles, Suffolk

Bailey, Mr. H. Grant .....98 Foregate street
Baillie, Mr. Edmund .....
*Bairstow, Mr. J., F.C.S.....Burley, Queen's park
Bairstow, Mrs. ..... " "
Bairstow, Mr. Herbert.....Lyndale, Vicar's Cross
Baker, Miss .....2 Grey friars
Ballance, Mr. W. .....5 Vicarage road, Hoole
*Ballard, Mr. E. G., A.R.S.M. ..Greenfield Cottage, Hoole road
Ballard, Mrs. ..... " " "
Bannister, Miss E. A. M. .....63 Foregate street
Barber, Ven. Archdeacon, M.A., F.S.A. ..... } St. Bridget's Rectory
Barber, Mr. John .....19 Eastgate street
Barbour, Mr. Geo., D.L., J.P. ..Bolesworth Castle, Tattenhall
Barbour, Mrs. ..... " "
Barnes, Mr. N. F.....Eaton gardens
Barnes, Mr. J. W. .....Grosvenor Park House, Union street
Barnes, Mrs. ..... " " "
Bassett, Miss C. E. .....68 Northgate street
Bate, Mrs. J. C. .....Summerfield, Kilmorey Park
Bates, Mr. W. N. .....Talbot Hotel, Newgate street
Bates, Mrs. ..... " "
Baxter, Mr. Geo. .....Park view, Panton road, Hoole
Beauchamp, Rt. Hon. The Earl K.C.M.G. } Madresfield Court, Malvern
Beauchamp, Rt. Hon. The Countess " "
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Beckett, Mrs. ..... " "
*Bedford, Rev. J. L., M.A., F.L.S.10 Abbey square
Bedford, Mrs..... " "
*Belton, Mr. J. C. .....Craigside, Sandy lane
Bennett, Mrs. J. Nevitt .....Addiscombe, Hough green
Best, Miss E. K. .....The College, Chester
Beswick, Miss Jessie.....3 Sunny bank, Queen's park
*Beveridge, Rev. P. J., M.A., B.Sc. (Hons). ..... } Olive Mount, Tranmere, Birkenhead
Beveridge, Mrs. ..... " " "
Birch, Mr. H. J. .....Corville, Liverpool road
Birch, Miss.....18 Upper Northgate street
Bithell, Mr. W. .....Messrs. Beckett & Co., Eastgate Row
Blagden, Mr. John J., M.R.C.S., L.R.C.P., 10 Nicholas street
Blagden, Mrs. ..... " "
Blayney, Mr. A. .....3 City Walls (W.)
Bleckly, Mr. Herbert S. .....Tentry Heys, Queen's park
Bleckly, Mrs. ..... " "
*Blogg, Rev. H. B., M.A. .....Frodsham Vicarage, Cheshire
Blomfield, Admiral Sir R. M., K.C.M.G. } c/o Messrs. Woodhead & Co., 44 Charing Cross, London
Blower, Mr. T. B.....6 The Groves
Boden, Mr. Robt. W. .....19 Corn Exchange Chambers
Bolland, Mrs. .....46 Hough green
Bolland, Mr. Frank ..... " "
*Bonnalie, Mr. Fredk. J., J.P., L.D.S., R.C.S., 7 Abbey square
Bonnalie, Mrs. .....Brookfield, Brook Lane
Booley, Miss.....11 Lorne street
Boscawen, Mrs..... Trevallyn Hall, Rossett
Bostock, Mrs. J. .....Kingsley Hey, Newton lane
Bowers, Mr. J. H. .....Tyddyn Ucha, Pen-y-bryn, Ruabon
Bowles, Mrs. T. S. .....The Hollies, Liverpool road
Bowles, Miss Agnes Millicent .. " "
Bowley, Miss Gladys.....Newgate Street House
Box, Miss Jessie .....4 Kilmorey road

Boyer, Miss Edith .....Witton House, Roodeye
Boyle, Rev. D. H., M.A., B.Sc...The College
*Boyce, Sir Rubert, F.R.S. .....The University, Liverpool
Bradbury, Mr. R. P. .....Walmore, Dee banks
Brassey, Miss.....Rose Hill, Bowdon, Cheshire
Brassey, Mr. Herbert .... .....The Limes, Curzon park
Brassey, Mrs. ..... " "
Bridge, Prof. J. C., M.A., D.Mus , F.S.A...Christ Church Vicarage
Bridge, Mrs. ..... " "
*Broadbent, Mrs. .....Bache Cottage
Broom, Mrs. ..... 2 Nicholas street
Brown, Mr. H. F., LL.B. .....18 Curzon Park
Brown, Mrs., M.A. ..... " "
Brown, Miss .....61 Bouverie street
Brown, Miss Daisy ..... " "
Brown, Mr. W. E. .....33 Parkgate Road
Brown, Mrs. ..... " "
*Brown, Mr. W. Ernest ..... " "
Brown, Mr. E. C. .....7 West Lorne street
Brown, Mr. Fred. .....2 Eastgate row
Browne, Mr. Morton.....Lacheholme, Lache lane
Browne, Mr. J. L., M.B., Ch.B...Dee Hills park
Browne, Mrs..... " "
Buckland, Miss .....31 Nicholas street
Bull, Mr. H. F. .....4 Sunny bank, Queen's park
Bullin, Mrs. .....20 Nicholas street
Bullin, Miss E. ..... " "
Burges, Miss J. V. .....Whitford, 11 Panton road, Hoole
Burges, Miss L. O. ..... " " "
Burness, Mr. Wm. .....Parr's Bank, Ltd., Chester
Burton, Miss G. .....The Limes, Weaverham, near Northwich
Butcher, Mr. Jas. .....140 Foregate street
Byrne, Mr. G. W.....5 Abbey square

Caldecott, Miss C. G. .....Metropolitan Children's Home, Broadstairs, London
Cameron, Mrs. .....57 Tarvin road
Campbell, Mrs. Pitcairn, .....Christleton Hall
Campbell, Mr. W. A. Pitcairn ..Bangor-on-Dee, Wrexham
Carr, The Hon. Mrs.....Elmhurst, 1 St. John's road, Queen's park
Carter, Mr. T. .....171 Boughton
Caruth, Miss Annie .....35 Clare avenue, Hoole
Catherall, Mr. Samuel .....1 Linenhall street
Chalton, Mr. T. W. .....Wynstay, Hoole
Chalton, Mrs. ..... " "
Chambers, Mrs. Frank .....13 Curzon park
*Chester, The Right Rev. The Lord Bishop of, ..... } The Palace, Dee Side
Chidley, Mr. T. .....14 St. Werburgh street
Clark, Miss Sybil .....Stanley House
Clark, Miss Eva .....19 Grosvenor street
Clarke, Mr. John .....Pasadena, Liverpool road
Clarke, Mrs. ..... " "
*Clarke, Mr. W. J. .....22 Corn Exchange Chambers
Clarke, Mr. Ernest (B. Eng.) .... " "
Clare, Mr. Horatio .....Grosvenor Schools
*Clay, Miss Beatrice E., B.A. ....The Queen's School
Clemence, Mr. Thos. .....56 Hough green
Clough, Mr. G. F. Butler .....78 Hough green
Cochrane, Mr. J. G. .....9 Grange road, Brook lane
Cockrill, Mr. C. P. .....Briercliffe, Hough green
Cockrill, Mrs. ..... " "

Coe, Mr. D. .....Howard Lodge, Hamilton street
Coe, Mr. Henry J. .....18 Queen's avenue
Coltart, Mr. C. B.....23 Hough green
Comber, Miss Mary Eleanor ....Woodville, Liverpool road
Comber, Miss Maria E. ..... ,, ,,
Comber, Miss Margaret ..... ,, ,,
Connah, Mr. Jas. .....12 Cecilia road, Heath drive, Hampstead, London, N.W.
Conway, Mr. Walter, C.A.....5 Sunny bank, Queen's park
Conway, Mrs. ..... ,, ,,
Cook, Miss Maud .....7 The Groves
Cook, Miss Alice M. ..... ,, ,,
Cook, Miss Kate ..... ,, ,,
Cook, Mr. Kenneth, C.A. .....Godstall Chambers
Cooke, Mr. J. H. .....6 Queen street
Cooper, Mr. John ..... 50 Liverpool road
Coppack, Mr. Chas. .....Gladwyn, Liverpool road
Coppack, Miss ..... ,, ,,
Coppack, Miss Nellie ..... ,, ,,
Crane, Mr. H. E., A.C.A. .....Savings' Bank House, Grosvenor street
Crooks, Mr. Kirke .....Morwenstowe, Queen's Park
Crooks, Mrs. ..... ,, ,,
Croston, Mr. J., Junr. .....Holmesdale, Brook lane
Croston, Mrs. ..... ,, ,,
Croston, Miss..... Dalmeny, Shavington avenue, Hoole
Cullimore, Mr. William ..... Christleton, Chester
Cumberbirch, Miss .....Hilbre, Garden lane
Cumming, Mr. Jas., L.D.S., F.P.S. Glasgow ..... } 39 City road
*Cummings, Mr. Sidney G. .....Heath Cottage, Upton, Chester
Cummings, Miss .....Bodlondeb, Caerwys, Flintshire
Currie, Dr. J. R., B.A., Oxon ..57 Bouverie street

*Darby, The Very Rev. J. L., D.D...The Deanery
Darby, Mrs. ..... ,,
Darby, Miss ..... ,,
Darby, Mr. Alfred, J.P. .....Laurel grove, near Wrexham
Davies, Miss Henrietta.....69 Boughton
Davies, Mr. E. Henry .....19 Francis street
Davies, Mr. Joseph ..... ,, ,,
Davies, Mr. John .....Parr's Bank, Limited, Chester
Davies, Rev. J. T., M.A. .....6 Abbey green
Davies, Mr. Arthur .....23 Lord street, Boughton
Davies, Mr. E. Harold..... Burland, Westminster park
Davies, Mrs. ..... ,, ,,
Davies, Mr. Horace, A.R.I.B.A., F.S.I...14 Newgate street
Davison, Mr. George .....4 Curzon park
Day, Mr. John .....Bryntirion, Chichester street
Day, Mrs. ..... ,, ,,
Day, Miss ..... ,, ,,
Delany, Mrs. .....7 Lorne street (south)
Deeley, Mr. C. H., J. P. .....Dalmeny, Saltney
Deeley, Mrs. ..... ,, ,,
Denson, Mr. W. .....21 Upper Northgate street
Denson, Mrs. ..... ,, ,,
Denson, Miss Adelaide ..... ,, ,,
Denson, Mr. J. Lyon .....4 Upper Northgate street
Denson, Mrs. ..... ,, ,,
Denson, Mr. W. H., J.P. .....Montalt, Westminster avenue, Hough green
Denson, Mr. F. R. .....Abbot's Mount, 33, Liverpool road
Denson, Miss E M..... ,, ,, ,,

Dickinson, Mr. D. .....1 Upton view, Hoole
Dickinson, Mrs. ..... " "
Dickson, Mr. J. H. .....Vindauga, Cavendish road, Hough green
Dickson, Mrs. ..... " " "
Dickson, Miss .....Grey Friars House
Digby, Miss .....2 Grey Friars
*Dobie, Dr. W. M., F.R.A.S.....4 Hunter street
*Dobie, Dr. W. H., M.B.....2 Hunter street
Dobie, Mrs. ..... " "
*Dobie, Dr. Herbert .....Northdene, Upper Northgate street
Dobie, Mrs. ..... " "
Dobie, Mr. Douglas .....Upton House, Chester
Dobie, Mrs. ..... " "
Dodd, Mr. W. ..... Derwent House, Vicarage road, Hoole
Dodd, Mr. Henry .....Lime grove, Panton road, Hoole
Dodd, Mr. John .....73 Bouverie street
Dodd, Mr. James .....c/o Mrs. Olney, 37 Nicholas street
Dodds, Mr. Arthur W., L.D.S.E. 16 Nicholas street
Donald, Mrs. .....The Cross
Douglas, Mrs. C. P.....St. Martin's House
Dowdall, Colonel A. P. .....25 Curzon park
Dowdall, Miss A..... " "
Downer, Mr. Reginald, M.B., B.S., M.R.C.S.—The Infirmary, Chester
*Drabble, Mr. Eric, D.Sc., F.L.S..Hartley Botanical Laboratory, University of Liverpool
*Drinkwater, Dr. H., M.D., F.R.S. (Edin.)—Grosvenor Lodge, Wrexham
*Duckworth, Mr. Henry, F.L.S., F.G.S.—7 Grey friars
Duckworth, Miss Evangeline M.E. " "
*Duff, Dr. J..... .....5 Abbey street
*Dunlop, Mr. G. A. ..... .....The Museum, Warrington
Dutton, Mr. George F. .....Aldersey Grammar School, Bunbury, Tarporley
Dutton, Mr. H. B. .....Freshfield, 27 Curzon park
Dutton, Mrs..... " "
Dutton, Mr. Stanley G. ..... " "
Dutton, Miss M. .....11 Grosvenor street
Dutton, Mr. A. E. .....51 Frodsham street
Dye, Mr. Alfred B. .....Fairhazel, 30 Bouverie street

Ealand, Mrs. .....Hovendene, Dee Hills park
Ealand, Mr. A. N. ..... " "
Edwards, Mr. J. E., L.D.S. ....Regent street, Wrexham
Edwards, Mr. C. P. .....Officer-in-charge, Marconi Telegraphs, Sable Islands, Halifax, N.S.
Eggers, Miss .....42 Hough green
Ellington, Mr. N. B. .....44 Bridge street row
*Elliott, Dr. John, B.S., B.Sc. ..24 Nicholas street
Elliott, Mrs. ..... " "
Elliott, Miss .....The Hawthorns, 29 Hough Green
Ellis, Mr R. Clarence .....5 White friars
Ellis, Mr. R. J. .....60 Foregate street
Evans-Lloyd. Col., J.P. .....Stanley House
Evans, Mr. Geo. H. .....The Limes, Lumley road
Evans, Miss E. M. .....54 Watergate street
Evans, Mr. A. H. .....St. George's Crescent, Queen's park
Evans, Mrs. ..... " " "
Evans, Miss Violet .....27 Hough green
Ewing, Mr. C. A. .....Rockcliffe, Queen's park
Ewing, Miss Alice Mabel ..... "
Ewing, Miss .....Cartref, Glan Aber park

Farmer, Mr. Richard .....56 Liverpool road
Farquhar, Mr. J. .....Strathmore, Queen's park
Farrimond, Mr. F. T. .....Sunnyside, Boughton
Fennah, Mr. G. H. .....Park House, Grosvenor park road
Fennah, Mrs. ..... " " "
Ferguson, Mr. W., J.P. .....The Cairn, Liverpool road
Ferguson, Miss J. M. ..... " "
Ffoulkes, Mr. Thomas B., Junr...8 Burlington road, Ipswich
Ffoulkes, Mr. Geo. B. .....28 Lorne street
Ffoulkes, Miss Jocelyn .....Kingsley Lodge, Liverpool Road
Ffoulkes, Miss H. Jocelyn ..... " "
Finchett-Maddock, Mrs. H. ....Cae Gwyn, Carnarvon
*Fish, Rev. A. H., B.A., B.Sc. ..Glendowen, Clifton Park road, Clifton, Bristol
Fish, Mrs. ..... " "
FitzGerald, Dr. W. A.....Clare Lodge
Fleming, Mr. T. R. .....Rowton Grange
Fleming, Mrs. ..... " "
Fletcher, Miss .....Gleneden, Curzon park
Fletcher, Miss E. B. ..... " "
Float, Mrs. S. M. .....20 Upper Northgate street
Fluitt, Miss .....5 Abbey green
Forster, Mr. W. Angus .....Belgrave Lodge, Pulford, Chester
Francis, Mr. H. K. .....63 Bridge street row
Frater, Mr. Geo. .....4 Leaside, Rhosddu, Wrexham
Frater, Mrs. ..... " " "
Freeman, Mr. C. E. .....Branksome, Brook lane
Freeman, Mrs. ..... " "
Frisby, Miss .....16 Chichester street
Frost, Mr. J. G., J.P. .....Boughton Hall
Frost, Mrs. ..... " "
Frost, Mr. J. M., J.P. .....Upton Lawn
Frost, Mr. T. Gibbons, C.C. ...Mollington Hall
Frost, Mrs. ..... " "
Fryer, Rev. J. W. .....24 Bouverie street

Gardner, Mr. E. .....Saighton House, Chester
Garnett, Mrs. .....The Rectory, Christleton, Chester
Garnett, Mr. J. W. .....45 Bridge street row
Garnett, Mrs. ..... " "
Garnett, Mr. J. G., M.A. .....Arnold House, Chester
Garnett, Mrs. ..... " "
Garside, Mr. Franklin .....Lingards, Prestatyn
Gaulton, Miss Lucy .....6 The Groves
Gibson, Major .....Buckley, *via* Chester
Gibson, Mr. R. M. .....Greenbank, Buckley
Gibson, Miss .....Witton House, Roodeye
Giffen, Mr. J. T. M., F.R.C.S. ..Richmond Hill, Boughton
Gilbert, Mr. Egerton .....21 Eaton road
Gilbert, Mrs. ..... " "
Giles, Mr. E. S. .....Gowymede, Vicar's Cross
Giles, Mrs. ..... " "
Gleadowe, Mr. H. T. S. .....11 Stanley place
Golder, Mr. Jas. T. .....Westminster park
*Goodman, Mr. A. E. .....Oakdene, Tarvin road
Goodhart, Mrs. E. S. .....100 Watergate flags
Gore, The Ven. Archdeacon, D.D...Bowdon, Cheshire
*Graham, Mr. J. Menteith.....36 King street
Graham, Mrs. ..... " "
Graham, Mr. Victor P. ..... " "
*Granger, Mr. F. M., M.R.C.S., L.R.C.P...18 Nicholas street
Grantham, Rev. H. .....S. Mary's Rectory
Grantham, Miss Gwynydd ..... " "

Gray, Miss.....6 Lorne street
Greatbanks, Mr. J. .....Kilmorey, Hoole road
Greenhouse, Mr. Chas. .....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S., M.B.M.S. } 31 Shrewsbury road, Birkenhead
Green, Mr. J. W.....The Grosvenor Museum
Greig, Mrs. .....Anfield, Dee banks, West
Griffin, Rev. C. A. .....The Vicarage, Dunham-o'-the-Hill
Griffin, Mrs. ..... " " "
Griffith, Mr. G. R., J.P. .....Grosvenor street
Griffith, Mr. G. B. .....13 St. Martin's fields
Griffiths, Mr. John .....77 Parkgate road
*Griffiths, Rev. T. T., M.A., R.N., H.M.S. "Isis" } Stirton, Victoria road, N., Southsea, Hants.
Griffiths, Mrs. Robert .....Exton park
Griffiths, Miss Bessie ..... " "
Griffiths, Mr. W. A. .....3 Exton park
Griffiths, Mrs. ..... " "
Griffiths, Mr. John .....Ball's Hall, Rossett
Griffiths, Miss ..... " "
Griffiths, Miss M. J. ..... " "
Griffiths, Mr. T. H. .. .....57 Ermine road, Hoole
Grills, Dr. .....The Asylum, Chester
Grills, Mrs. ..... " "
Grindley, Mr. J. .....3 Eastgate street
Grindley, Mr. W. J. .....25 Cecil terrace, Boughton

Haigh, Mrs. James Alfred .....3 The Groves
Hales, Miss .....Cop House, Sealand road
Hall, Mr. James .....24 Saughall road
Halsall, Miss .....4 Heath terrace, Boughton heath
*Hamilton, Mr. A., F.R.C.S., J.P. .. Bodafon, Deganwy, N. Wales
Hamilton, Mrs. ..... " " "
Hamilton, Mr. A. G., M.B. ....23 Hoole road
Hamilton, Mrs. ..... " "
Hankinson, Miss .....61 West street, Hoole
Hannon, Miss .....92 Foregate street
Harris, Mr. T. .....Claremont, Dee banks
Harris, Mrs. ..... " "
Harris, Rev. H. .....16 Hough green
Harris, Mrs. ..... " "
Harris, Mrs. S. H. .....Dyreham, Wrexham road
Harley, Mr. T. D. .....41 Cheyney road
Harvey, Miss.... .....Fern Lea, Stamford Bridge, nr. Chester
Haselden, Mr. J. H. .....Delamere street
Haswell, Mr. John Edward.....Dee tower, Chester
Haswell, Mr. G. H. .....Highfield, Queen's park
Haswell, Mrs. ..... " "
Haswell, Mr. W. H... .....94 Foregate street
Haswell, Mr. Geo. W... .....28 Bouverie street
Haswell, Mr. Frank ..... " "
Hatch, Mr. Herbert A., M.Sc. ..The Grosvenor Museum
Hatton, Mr. William .....Figdale, 25 Lorne street (North)
Hatton, Mrs..... " " "
*Hawkins, Mr. J. M.....Fernleigh, Glan Aber park
Hawley, Mr. John George .....42 Newgate street
Haydon, Miss G. .....8 Gladstone road
Hayes, Mr. J. .....Grosvenor Park Hotel
Heeley, Miss .....24 Moss bank, Parkgate road
Hemmings, Miss .....The Infirmary
Henderson, Mr. J. E. .... .....19 Pathway, Queen's park
Henderson, Mrs. .....9 Union walk
Heppel, Miss .....39 Lord street

*Hetherington, Mr. T. .....Engineers' Department, The Post-Office, Glasgow
Hewitt, Mr. D. L. .....2 Hough green
Heywood, Mr. H. A. .....Christleton lodge
Higgins, Mr. F. W. .....14 Egerton street
Higginson, Mr. T. .....Engelberg, Percy road
Higuett, Mr. H. Napier .....Shandon, Hough green
Hobbs, Mr. C. J. .....2 Eversley park
Hobbs, Mrs. ..... ,, ,,
Hobday, Mr. Jas. .....Alexandra villa, Liverpool road
Hobday, Mr. Wm. Edward ....22 The Groves
*Hodge, Mr. J. Philp .....7 Hoole park, Chester
*Hodges, Mr. W. .....62 Hough green
Hodgkinson, Miss .....4 Garden lane
Hodgson, Mr. Wm. W. .....65 Northgate street
Hogarth, Mr. T. O., M.I.Mech.E...The Lodge, Saltney
Holland, Miss .....17 Chichester street
Holmes, Mrs. L. B. .....Ashcroft, Hough green
Holmes, Miss Ruth ..... ,, ,,
Holme, Mr. Samuel H. .....Downswood, Liverpool road
Holt, Mr. T. J. W., B.Sc. .....c/o Messrs. The Dee Oil Co., Ltd., Saltney
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopley, Mr. J. H. .....6 Northgate street
Hopley, Mrs. ..... ,, ,,
Hopton, Mr. W. A. .....24 Moss bank, Parkgate road
Hopton, Mrs. ..... ,, ,,
Hopwood, Miss .....The Deanery
Hornby, Mr. Alex. .....Shipgate House
Hornby, Mrs. ..... ,,
Horner, Mr. W. .....42 Grey Rock street, Liverpool
*Howard, Mr. F. T., M.A., F.G.S..West Mount, Waverton
Howard, Mrs. ..... ,, ,,
Howson, Miss .....The Rectory, Guiseley, Yorks.
*Howe, Rev. W. Norton, M.A. ..The Parsonage, Mow Cop, Cheshire
Howitt, Mr. J. H., M.A., LL.B. M.R.C.S., L.R.C.P. .... } Lyme Regis, Hough green
Hughes, Mrs. McKenny ....Ravensworth, Brooklands avenue, Cambridge
Hughes, Mr. John .....47 Victoria street, Westminster, London
*Hughes, Mr. T. Cann, M.A., F.S.A. ...78 Church street, Lancaster
Hughson, Mr. Arthur .....2 Eastgate row, north
Hughes, Miss Winifred .....6 Baths street
Hughes, Mr. W. H. .....Moss bank, Newton-by-Chester
Hull, Mr. G. S. N. .....51 Gladstone avenue
Humberston, Mrs. .....11 Pelham crescent, London, S.W.
Humphreys, Mr. E. Noel, F.C.A,..Caer-y-Caëë, Hoole
Humphreys, Mrs. ..... ,, ,,
Hunter, Mr. Jas. .....Maisonette, Hough green
Hunter, Mrs. ..... ,, ,,
Hutton, Mr. F. W. .....53 Greenway road, Runcorn

Illingworth, Mr. F. H. .....12 Liverpool road
Illingworth, Mrs. ..... ,, ,,

Jack, Mr. A. S. .....Belle Vue, 72 Hough green
Jackson, Miss ..... 52 Hough green
*Jackson, Mr. Randell, M.B ,M.Sc..67 Hoole road
Jackson, Mrs. ..... ,, ,,
Jackson, Rev. A. E., M.A. ....The College
James, Mr. J. F. .....1 Mount Pleasant, Saltney
Jameson, Miss .....The Queen's School

*Jebb, Mr. G. R., C.E. ..... Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A. M.B., L.R.C.P., M.R.C.S. } 12 Upper Northgate street
Jenner, Mr. H. A. ..... 11 White Friars
*Johnson, Mr. M., L.D.S.I. ..... 21 York villas, Lorne street, north
Johnson, Mr. Thomas C. ..... 30 Eastgate row
Johnson, Mrs. Mayo ..... 10 Lorne street
Johnson, Miss R. ..... 52 Bridge street row, west
Johnson, Mr. H. P. ..... Highclere, Brook lane
Johnson, Mrs. ..... " "
Jolliffe, Mr. H. D. ..... Kilbroney, Curzon park
Jones, Miss ..... 3 Lorne street
Jones, Mr. Jno. ..... The Spinney, Hunter street
Jones, Mr. David Brellisford .... Avoca, Garden lane
Jones, Miss Gwladys M. ..... " "
Jones, Mr. Owen E., J.P. ..... Tynrheol, Amlwch
Jones, Mr. Fred ..... 112 Foregate street
Jones, Miss A. E. ..... Higher Grade School, Hunter street
Jones, Mrs. W. H. ..... Cliveden, Hough green
Jones, Mrs. Evan ..... Bodrenig, Bala, N. Wales
Jones, Mrs. Wm. ..... 33 Cuppin street
Jones, Mr. Henry ..... 96 Watergate Flags
Jones, Mr Robert W. ..... 39 Gladstone road
*Jones, Rev. Richard, B.A. ..... Penybryn, Llandinam, R.S.O., Mont.
Jones, Mr. E. B. ..... 12 Queen's avenue
Jones, Mr. Charles ..... 50 Princess street
Jones, Mr. Eric Marsden ..... Tilston Rectory. Malpas
Jones, Mr. George ..... 20 George street
Jones, Mr. W. Llewelyn ..... The Oaks, Helsby
Jones, Mr. John, J.P. ..... Coniston, Newton, Chester
Jones, Mr. J. H. Stanley ..... Glenhurst, Hoole road
Jones, Mr. W. A. ..... The Grosvenor Museum
Joyce, Rev. Canon G. C., M.A. .. St. Deiniol's Hostel, Hawarden

Kay, Mr. John ..... 3 Northcote Mansions, Hampstead Heath, London, N.W.
Keell, Mr. James A. ..... Manor House, Queen's park
Kenyon, Mr. G. A., M.B. ..... Poplar House, Flookersbrook
Kenyon, Mrs. ..... " "
Killon, Mr. R. W. ..... 59 Tarvin road
Killon, Mrs. ..... " "
Kind, Mrs. ..... Stoneby Drive, New Brighton
King, Mrs. ..... 26 Nicholas street
*Kingsley, Miss ..... Keys, Eversley, Winchfield
Knight, Miss ..... 8 Eastgate row
Knowles, Mr. E. R. ..... 15 Grosvenor street
Knowles, Miss ..... " "
Kynnersley, Mr. E. M. Sneyd .. Boughton Lodge

Laing, Miss S. C. ..... 2 Mount Pleasant, Saltney
Laing, Miss H. C. ..... St. Michael's School
Lamb, Mr. R., J.P. ..... Hoole road
Lamb, Mrs. ..... "
Lamb, Mr. R., junr. ..... Yrfon, Granville road
Lamb, Mrs. ..... " "
Lamb, Mr. W. A. ..... 6 St. Anne street
Lamont, Mr. A. ..... Oldfield road, Heswall
Lancaster, Mr. Arthur ..... 14 Weaver street
Lanceley, Mr. R. H., J.P. ..... Victoria road

Latham, Mr. J. S. .....Green bank, Liverpool road
Latham, Mrs. ..... " "
*Lawrence, Dr. A.....The Asylum, Chester
Lawson, Mr. Philip H. .....St. Eilian, Newton
Laybourne, Mr. J. H. .....21 The Groves
Laybourne, Mrs. ..... " "
Leah, Mr. W. .....Strathearn, Hoole road
Leather, Mr. Wm. .....40 Lower Bridge street
Leaton, Miss Isabel .....Glanavon, Boughton
Lees, Mr. W., M.R.C.S. .....The Bars
Lewis, Rev. J. S., M.A. .....The Vicarage, Ruabon
Lloyd, Sir Horatio, Knt. .....8 Stanley place
Lloyd, Mr. F. Horatio..... " "
*LLoyd, Colonel Wilford N., J.P..Eccleston hill, Chester
LLoyd, Mrs. ..... " "
Lloyd, Miss M. E. .....13 Chichester street
Lloyd, Miss C. .....62 Princess street
Lloyd, Mr. G. .....38 Duke street
Lloyd, Mr. W. H. .....Glenhurst, Hoole road
Lloyd, Miss .....24 Castle street
Lockwood, Mrs. .....Fern House, Queen's park
Lockwood, Miss .....6 Spring gardens, Hoole
Loft, Miss ..... .....Station House, Blacon
*Longbottom, Mr. F. W., F.R.A.S..Haslemere, Queen's park
Longbottom, Mrs. ..... " "
*Lovell, Mr. A. E., M.A. .....75 Bouverie street
Lovell, Mrs. ..... " "
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. ..... } 18 Hough Green
Lowe, Mrs. ..... " "
Lowe, Mr. Jas. F., B.A.....47 Dee banks
*Lucas, Mr. A. W., F.G.S. ....4 St. John's road, Queen's park
*Lysaght, Colonel .....Watergate House

Macdonald, Mr. G. .....3 Abbey square
*Macdonald, Miss Eva, M.A. .... " "
*Macdonald, Mr. G. E., L.D.S.E..10 Bladud buildings, Bath
MacGillycuddy, Major, J.P. ....Bache Hall, Chester
MacGillycuddy, Mrs. ..... " "
Mackenzie, Miss, B.Sc. .....1 Halkyn road, Hoole
Maddocks, Mr. Frank .....Briar Dene, Percy road
Maddocks, Miss .....8 Abbot's Nook, Victoria road
Mann, Dr. A. .....18, Newgate street
Mann, Mrs. ..... " "
Mann, Miss ..... " "
Margerison, Mr. L. .....Love Street Council School
Marriott, Mr. J. W.....The Grosvenor Museum
Marsden, Miss .....6 Grosvenor park road
Marshall, Major ..... .....Greystones, Waterloo road
Marston, Mr. F. ..... .....School of Art, The Grosvenor Museum
Martin, Mr. H. M. ..... .....Parr's Bank Limited, Chester
Massey, Miss ..... .....10 Baths street
Mason, Mr. F. B. .....39 Liverpool road
Mason, Mrs. ..... " "
Matheson, Mr. Alex .....20 Castle street
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
Matthews, Miss .....County Asylum, Chester
Matthews, Mr. A. E. .....5 Parkgate road
McKerchar, Mr. John ..... } 35 Giesbach road, Upper Holloway, London, N.
McKinlay, Mr. J. .....31 Cheyney road

*McMichael, Mr. J. A., B.A., B.Sc...39 Parkgate road
McMichael, Mrs. ..... ,, ,,
Meacock, Miss ..... .....c/o Mr. R.R. Salmon, Holly bank, Rowton
Meeson, Mr. W. H. .....16 Eastgate row
Mill, Miss F. .....26 Eaton road
Mill, Miss Frances .....St. Mary's Rectory
Millington, Mr. C. .....Shordley Green, Hope, near Mold
Millington, Mrs. ..... ,, ,, ,,
Mills, Mrs. .....15 Chichester street
Mills, Mr. Richard .....Cartre, Westminster avenue
*Miln, Mr. G. P. .....Milnholme, Brook lane
Miln, Mrs. ..... ,, ,,
Miln, Mr. Thos. Edward .....14 Arpley street, Warrington
Milner, Mr. J. A., B.A. (Oxon) ..Manor Farm, Barnston, nr. Birkenhead
Minns, Mr. Alfred.....10 Marlborough terrace, Londonderry
Minshull, Mr. C. H.....5 Lorne street
*Mitchell Rev. J. C., B.D., F.R.A.S Brenvar avenue, Ardnadam, Argylshire
Moat, Miss F. ..... .....24 Castle street
Mond, Mr. Alfred, M.P.....Winnington Hall, Chester
Mond, Mrs. ..... ,, ,,
Moore, Mrs. H.....2 Queen's park
Moreton, Mr. T. W. E., M.R.C.S...Tarvin
Morgan, Mr. R. T. .....2 Newgate street
*Morris, The Rev. Canon, D.D., F.S.A. ..... ..... } St. Gabriel's Vicarage, 4 Warwick square London, S.W.
Morris, Miss C. ..... .....Avondale, Halkyn road
Moss, His Honour Judge.....50 Hough green
Moss, Mrs. ..... ,, ,,
Moss, Mr. Wm. Richardson.....The Oaks, Upton, Chester
Moss, Mrs. ..... ..... ,, ,,
Mostyn, Sir Pyers W., Bart. ....Talacre, Holywell
Mostyn-Roberts, Mrs. R. .....Bryntirion, Chester
Moulton, Mr. John W. .....24 Lord street, Boughton
Mulvey, Mr. W. E. .....9 Overleigh road
Murray, Miss..... .....1 Derby place, Hoole
Musgrave Mr. J. .....45 White friars
Musgrave, Mrs..... ,, ,,
Musgrave, Mr. A. J. ..... ,, ,,
Musgrave, Miss .. ..... ,, ,,
Muspratt, Mr. E. J. .....Within Croft, Dee banks
Muspratt, Miss ..... ,, ,,

New, Mr. Henry .....14 Crane street
New, Mr. Wm. J. ..... ,, ,,
Newbold, Mr. G. H. .....10 Paradise row
Newall, Dr. W. A. .....Bolland's Court House, White friars
Newall, Mrs. ..... ,, ,,
Newman, Mr. J. E. .....1 Sunny bank, Queen's park
Newman, Mrs. ..... ,, ,,
Newstead, Mrs. R. .....Witcombe Villa, Handbridge
*Newstead, Mr. Alfred .....The Grosvenor Museum
Nicholls, Mr. G. F. .....20 Chichester street
Niven, Miss .....8 Seller street
Niven, Miss M. D. ..... ,, ,,
Nixon, Mrs. .....Selkirk road, Hough green
Nixon, Mr. J. G. ..... ,, ,,
Norbury, Mr. T. .....Hill Crest, Upton heath
Nutting, Miss F. A. .....Gloverstone, Castle street

Ockleston, Mr. Wm. .....4 Abbot's Hayes, Liverpool road
*Okell, Mr. E. W. .....22 Northgate street
*Okell, Mr. P. H. .....Wisbeach House, Glan Aber park

Orrett, Miss .....West view, Garden lane
Osborne, Mr. Geo. F. .....9 Sumpter pathway, Hoole
Owen, Mr. A. .....1A Halkyn road, Hoole
Owen, Mr. W. J. ..... ,, ,,
*Owen, Mr. R. Cecil, B.Sc. .....89, Foregate street
Owens, Mr. John ..... .....5 Grey friars
Owens, Mrs. ..... ,, ,,
Oxenbould, Mrs. .....4 Abbey street

Page, Miss .....c/o Miss Ellis, Mount Pleasant, Saltney
*Parry, Mr. T. S., M.B. .....10 Upper Northgate street
*Parry, Mr. Morys .....37 Victoria road
Parry, Mr. Robert .....Westcote, Hoole road
Parry, Mr. S. Taylor .....4 Princess street
Pate, Mr. Thomas..... ...29 Chichester street
Paxton, Mr. F. .....Belmont House, Dee banks
Paxton, Miss ..... ,, ,, ,,
Payne, Miss .....4 Abbey green
Payne, Miss A. ..... ,, ,,
Payne, Mr. H. C. .....The Cottage, Eccleston
Pearson, Mr. F. C. .....Huke's Library, The Eastgate
Pearson, Mrs. .....Fircroft, Hough green
Pearson, Miss G. ..... ,, ,,
Phillips, Rev. J. ..... .....St. Barnabas' Mission House, Sibell street
Polkinghorne, Mr. Chas. .....47 Tarvin road
Pollard, Miss .....The Queen's School
Posnett, Mr. L. W. .....19 Raymond street
Posnett, Mrs. ..... ,, ,,
Potter, Mr. William .....18 Vandyke street, Liverpool
*Potts, Mr. A., M.A. .....Diocesan Training College
Potts, Miss L. S. .....17 Hough green
Powell, Mrs. T. J. .... .....37 White friars
Powell, Miss .....38 Eastgate row
Powell, Miss A. L. .....The Queen's School
Poyser, Mr. Henry ..... 34 Nicholas street
Preece, Sir Wm. H., K.C.B., F.R.S...Penrhos, Carnarvon
Preston, Mr. A. C. .....Abbot's Grange, Liverpool road
Preston, Mr. A. M. ..... ,, ,,
Price, Mr. T. Walmsley .....26 Watergate row
Prichard, Miss .....9 The Groves
Priddey, Mr. A. B. .....25 Seller street
Pringle, Mr. Wm. .....30 Cambrian crescent
Proud, Miss M. H. .....Ashmount, Tarvin road
Pye, Mr. Fred A. .....Highfield park, Rhyl
Pye, Mrs. ..... ,, ,,

Raby, Mr. E. J. .. .....13 Vicarage road, Hoole
Randles, Miss H. .....2 Baths street
Read, Mrs. .....Kenwyn, Dee banks
Redman, Mr. W. R., B.A., B.Sc..Inglewood, Glan Aber park
Reese, Mr. J. E. .....39 Halkyn road
Reynolds, Mr. G. H. .....67 Liverpool road
Ribton, Mrs. .....Cartref, Glan Aber park
Rigby, Miss Honora M. .....2 Abbot's Hayes, Chester
Robb, Mr. J. D. .....37 Northgate street
Robb, Mrs. ..... ,, ,,
Roberts, Miss .....Bank Cottage, Neston
Roberts, Miss Johnson .....West Point, 40 King street
Roberts, Mr. B. C., J.P. .....Oakfield, Upton
Roberts, Mrs. ..... ,, ,,
Roberts, Mr. J. Sheriff, J.P.....The Gables, Curzon park
Roberts, Mrs. ..... ,, ,,

*Roberts, Mr. John Thos., M.B...Montana House, 127 Boughton
*Roberts, Mr. E. Owen .....144 Boughton
Roberts, Mrs. .....The Nook, Westminster park
Roberts, Mr. Frank E., J.P.....3 Sandown terrace
Roberts, Miss Clara.....Washington Hotel, Chester
Roberts, Mr. W. H. .....6 Ash Grove, Wrexham road
Roberts, Mr. W. Pierce .....The Shrublands, Hoole
Roberts, Miss Lucy .....5 Ermine road, Hoole
Roberts, Miss Gladys ..... ,, ,,
Robertson, Mr. H. R., F.R.M.S..Upton grange
Rogers, Mr. James .....22 Black friars
Rogers, Mrs..... ,, ,,
Rogers, Mr. William .....104 Watergate flags
Rogers, Mr. C. W. ..... ,, ,,
Rogers, Miss P. .....88 Watergate flags
Rogers, Mr. Arthur Leslie.....24 Lorne street
Rogerson, Mr. G. H. .....Polefield, Liverpool road
Rose, Mr. W. R.....23 Bridge street row
Ross-Wallis, Mr., L.D.S. .....Grosvenor road, Wrexham
Ross-Wallis, Mrs. ..... ,, ,,
Rowland, Mr. L. B. .....Whybro House, Wrexham
Royle, Mrs. .....Hough Green House
Rutherfoord, Dr. .....8 Abbey square

Sadler, Mr. James H. .....24 Albion street
Salmon, Miss Maud.....39 White friars
Savage, Colonel..... .....20 Curzon park
Scouller, Mr. Walter, B.Sc. ....12 Moss bank, Parkgate road
Scott, Mr. John .....Brook lane
Scott, Rev. Canon S. Cooper, M.A...St. John's Rectory
Segar, Mr. F., L.D.S.E. .....White Friars House
Sewell, Mr. F. C. .....26 Grosvenor road
Sexaner, Miss .....43 Foregate street
Shand, Miss E. M. .....Kingston House
Shand, Miss E. F. ..... ,, ,,
Sharkey, Mr. J. .....Inland Revenue Office, 16, White friars
Shaw, Mr. R. G. .....6 Bridge street
*Shepheard, Mr. T., F.R.M.S. ..Kingsley, Bournemouth West
Shepheard, Miss ..... ,, ,,
Shepheard, Mr. W. F. J., F.C.S...Bridge street row
Shepheard, Mrs. .....Eversley, Hoole
Shepherd, Rev. F. E. A., M.A...20 Brook lane
Shires, Miss M.....80 Brook street
*Shone, Mr. W., F.G.S. .....Upton park
Shone, Miss G..... ,,
Shone, Mr. Wm., Junr. ..... ,,
Shurrock, Mr. F. A. .....School of Art, The Grosvenor Museum
Shuttleworth, Mrs. A.....Waterside Lodge, Barrelwell Hill, Boughton
*Siddall, Mr. J. D. .....23 Eaton road
Siddall, Mrs..... ,, ,,
Siddall, Miss G. M. ..... ,, ,,
Siddall, Mr. Charles Kingsley .. ,, ,,
Siddall, Mr. T. A. ..... ,, ,,
Siddall, Mr. W. W. .....Percy road
Siddall, Mrs..... ,,
Sill, Mr. T. S. .....Bridge Colour Co., Ltd., Stalybridge
Simon, Mr. John .....4 Eastgate row
Simon, Mrs. ..... ,, ,,
Simpson, Mr. Ricardo.....Newton bank

*Simpson, Mr. Frank .....10 Grosvenor street
*Skeat, Miss E. G., D.Sc. .....The Queen's School
Skeldon, Mr. J. .....20 West Lorne street
Skelton, Mr. J. M. .....4 Ash grove, Wrexham road
Skelton, Mrs. ..... ,, ,,
Skipwith, Mr. Francis, J.P. ....9 Eversley park
Smith, Miss H.....3 Abbey green
Smith, Mr. T. .....9 White friars
Smith, Mr. Emanuel L. .....14 St. Werburgh street
Smith, Mr. T. J. F., F.R.A.S...Newstead, Wavertree, nr. Liverpool
Southworth, Mr. Joel .....10 Paradise row
Sparling, Rev. W., M.A. .....Upton Vicarage, Chester
Spencer, Mrs. W. A. .....30 Hough green
Spencer, Miss Annie .....50 Eastgate row
Spurling, Rev. Canon F. W., M.A..9 King street
Stendall, Mr. J. A. Sidney.....The Grosvenor Museum
Stephen, Mrs. Peter .....Crosslooms, Mollington
Stevens, Mr. T.....14 Eastgate row
Stewart, Mrs. .....13 Stanley place
*Stirling, Mr. James .....5 Dorlcote road, Wandsworth Common, London, S.W.
Stolterfoth, Mrs. .....1 Grey friars
Stolterfoth, Miss ..... ,,
Storr, Mr. F.....19 The Groves
Storr, Miss..... ,, ,,
Storrar, Mr. Andrew, J.P.....Bryntirion, Chichester street
Stowe, Mr. F. W. ..... ...The Grosvenor Museum
Sturge, Mr. F. A. .....Coed Efa, Wrexham
Stubbs, Mr. E.....Bache Hall Gardens
Sumner, Mr. William .....11 Chichester street
Sutton, Mr. D. Carlyle, M.B. ..62 Watergate street
Sutton, Miss ..... ,, ,,

Tait, Miss Daisy .....10 Derby place, Hoole
Tasker, Mr. W. .....Moulson House, Hoole road
Tasker, Mrs. ..... ,, ,,
Tatler, Mr. A. A. .....16 Bouverie street
Taylor, Mr. J., F.R.C.S., J.P. ..Haygarth House, 28 Nicholas street
Taylor, Miss ..... ,, ,,
Taylor, Mr. J. R..... ,, ,,
Taylor, Dr. J. G., M.A. .....35 Nicholas street
Taylor, Mr. A. G... .....6A Woodsome road, Highgate road, London, N.W.
Teaves, Miss .....Langham House, 37 City road
Thomas, Dr. E. J. Haynes .....18 Pepper street
Thomas, Miss ..... ,, ,,
Thomas, Miss Constance..... ,, ,,
Thomas, Miss F. M. ..... ,, ,,
Thomas, Mr. Maurice .....41 Halkyn road, Hoole
Thomas, Mr. E. H. .....The Industrial Schools, Boughton
Thomas, Mr. W. C. .....56 Northgate street
Thomas, Mr. H. F. .....1 Victoria pathway, Queen's park
Thomas, Mrs. ..... .. ,, ,,
Thomas, Mr. A. E., B.A., M.B...Medical Officer of Health, Forest House
*Thompson, Mr. Joseph .....20 South view, Sealand road
Thompson, Mr. Edward P.....Paulsmoss, Whitchurch, Salop
Thompson, Miss Ethel.....19 Cheyney road
Thompson, Miss .....30 Eaton road
Thomson, Miss I.....9 Cambrian view
Thomson, Mr. J. R., J.P., ....Uffington House
Thomson, Mrs. ..... ,, ,,

Thornthwaite, Mr. Noel .....c/o Mrs. Hincks, Brantwood, Brook lane
Thornthwaite, Miss E. M. ..... ,, ,, ,,
Thornthwaite, Miss H. L. ..... ,, ,, ,,
Thornton, Miss .....Grosvenor (St. John's) Girls' School
Tidswell, Mrs. R. T. ..... } The Richard Tidswell Memorial Home, Upper Northgate street
Tilston, Miss .....Harlestone, Newton lane
Tobias, Mr. John .....Crypt Chambers, Eastgate row
Tomkinson, Mr. Jas., M.P. ....Willington Hall, Chester
Townshend, Miss S. .....2 Baths street
Townshend, Mr. C. W., J.P. ..Charlton Kings, Cheltenham
Trott, Rev. H. W. .....Manor House, Saighton
*Tupling, Mr. C., B.A. .....Wirral House School, 4 The Bars
Turner, Mr. Edward.... .....Bridge Cottage, Port Sunlight
Tyson, Miss Alice..... .....9 Frodsham street

Upton, Mr. Seward Chase .....Bank House, St. Werburgh street

Venables, Mr. W. H. .....100 Faulkner street, Hoole
Vernon, Mr. W., J.P.....57 Upper Northgate street
Vernon, Mr. Wm. .....Shotwick park, Chester
Vernon, Mr. J. Thorneycroft ....Bryn Gwyn Hall, Caerwys

Wakefield, Mr. Robert ..... Heath Cottage, Stanney
*Walker, Mr. A. O., F.L.S., J.P..Ulcombe place, near Maidstone
Walker, Mrs..... ,, ,,
Walker, Mr. Ernest.....8 Sibell street
Walker, Mr. John Stringer.....2 Abbey green
Walker, Miss Kate .....4 Grey friars
Walker, Mr. C. G. .....11 The Groves
Walker, Mr. James ..... ,,
Waller, Rev. A. H., M.A.....34 Eaton road
Walley, Mrs. ..... .....Lyncroft, Raymond street
Walley, Mr. F. .....6 Abbey square
Walpole, Mr. John E.....Cops Lea, Dee banks
Ward, Miss .....Derby House, Hoole road
Ward, Mr. R. P. .....4 Hough green
Ward, Mrs. ..... ,,
Warmsley, Mr. F. J. .....Abbot's Holme, 69 Liverpool road
Warmsley, Mrs. ..... ,, ,,
Warmsley, Miss .....11 Vicarage road, Hoole
Warmsley, Miss L. ..... ,, ,,
Watkins, Mrs. .....71 Parkgate road
Way, Mr. N. A. E. .....Bradpole, 57 Liverpool road
Weaver, Mr. John .....Fern Cottage, Christleton
*Webster, Mr. G. Watmough, F.C.S., F.R.P.S. } Grange road, West Kirby
Webster, Mrs. M. S. .....14 St. John's road, Queen's park
Webster, Miss ..... ,, ,,
Wells, Mr. E. .....Eccleston, Chester
Welsby, Mr. Walter .....Bosville, 25 Liverpool road
Welsby, Mrs..... ,, ,,
*Welsh, Mr. John, M.R.C.S., L.R.C.P., F.C.S...43 Tarvin road
Welsh, Mr. W..... .....34 Tarvin road
West, Mr. F. F. ..... .....18 Prince's avenue, City road
West, Mr. G. H. .....Lache Cottage
West, Miss Eva..... .... ,, ,,
Westminster, His GraceThe Duke of..Eaton, Chester
Westminster, Her Grace The Duchess of ,,

Westminster, Her Grace Katherine Duchess of..Combermere Abbey, Whitchurch (Salop)
*Whichello, Mr. H., L.R.C.P., M.R.C.S...The Mount, Tattenhall, Chester
Wigg, Mr. Walter J. .....The Firs, Newton
Wilkinson, Miss M. .....51 Granville road
Williams, Mr. John .....Blue Bell bank, Saltney
Williams, Miss Aldersey .....100 Watergate flags
Williams, Mr. James .....24 Hough green, Chester
Williams, Mr. Vincent, B.A..... " " "
Williams, Mr. A. T. .....15 Cheyney road
Williams, Mr. W. .....The Croft, Flookersbrook
Williams, Miss Pattie .....Greenfield, Upton heath
Williams, Mr. R. G. .....White friars
Williams, Mr. W. Heathcote ....Watford House, Victoria road
Williams, Mrs. ..... " "
Williams, Mr. W. R., M.A. ....Rylease, Stocks lane
Williams, Mr. Geo. ..... ....12 Filkin's lane, Tarvin road
Williams, Miss .....4 Alma street, Boughton
Williams, Miss Florence J. ....10 Spring Gardens, Flookersbrook
Williams, Dr. Trevor .....31 Nicholas street
Williams, Mr. W. J. .....8 St. Werburgh street
Williams, Mrs. ..... " "
Williams, Dr. David Llewelyn, M.D., D.P.H. ..... } Medical Officer of Health, Wrexham
Williams, Mr. W., D.Sc. .....Rhyd, Broughton, Wrexham
Williams, Mrs. ..... " "
Williamson, Mr. A. J., B.A. Cantab. .7 Brookside villas, Hoole road
Williamson, Mr. Thomas .....Cuppin street
Wilson, Mr. E. Siddons .....41 City road
Withers, Miss M.P. .....2 Watergate square
Withers, Miss C. ..... " "
Witter, Mrs. .....Riverslea, Dee banks
Wolfe, Mrs. .....Broomhurst, Newton, Chester
Wolfenden, Miss Marion.....21 Hough green
Wood, Miss .....30 Hough green
Woodall, Miss Ella .....13 Abbey square
Woodhouse, Mr. H. H., B.A. ..The King's School
Woodroffe, Mr. Frank K. .....18 Vicarage road, Hoole
Woodroffe, Mrs. ..... " "
Wordsworth, Miss A. E. .....Victoria (Girls) Council School, Wrexham
Wright, Rev. Harold H., M.A...Precentory, Abbey street
Wright, Mrs. ..... " "
Wright, Dr. R. B. .....Folliott House, 55, Northgate street
Wright, Mrs. ..... " "
Wyld, Mr. Norman .....11 City Walls
Wyld, Mrs. ..... "
*Wynne, Mr. Geo. F. .....Plas Gwyn, Minera, Wrexham
Wynne, Mr. J. H. .....49 Tarvin road
Wynne, Mrs. ..... "
Wynne, Mr. John.....Elm Bank, Rowton, Chester

# LIST OF JUNIOR MEMBERS

*(Under Rule 6).*

Anderson, Percy .....26 Hamilton street, Hoole

Bairstow, Eric John.....Burley, Queen's park
Baker, John .....29 Gladstone avenue
Baker, Miss Ella ..... ,, ,,
Barber, John Lawrence .....4 Kilmorey road
Barber, Miss May ..... ,, ,,
Bate, Roger .....Summerfield, Kilmorey park
Belton, F. W. J. .....Craigside, Sandy lane
Bennett, Miss M. Cecil .....Addiscombe, Hough green
Bleckly, Herbert .....Tentry Heys, Queen's park
Brassey, J. E. .....The Limes, Curzon park
Burges, R. O. .....Whitford, 11 Panton road, Hoole
Burton, Clifford E. .....The Limes, Weaverham, near Northwich

Chalton, Miss Phyllis .....Wynstay, Hoole
Clough, Miss Judith A. .....78 Hough Green
Collins, Vivian .....c/o "Kings," 14 Eaton road
Cooper, Miss Rosamond G. ....50 Liverpool road
Croston, Miss Emily .....Holmesdale, Brook lane

Day, Miss Gladys .....Bryntirion, Chichester street
Delany, Miss .....7 Lorne street (South)
Dickinson, Kenneth S. .....1 Upton view, Hoole
Dutton, Norman Edgar .....Wellfield, Newton

Edwards, Thomas Wynne .....Brynteg, Hough green (South)
Ellis, Arthur .....Mosslea, 3 Chester street, Saltney
Evans, Alan .....27 Hough green

Fennah, Bertie .....Park House, Grosvenor Park road
Field, Miss Elizabeth Isabel ....31 Gladstone avenue
Foster, Roe .....Roade Villa, Upton park
Frost, Miss Olive .....Mollington Hall

Gardner, Miss .....Saighton house
Gibson, Geo. Philip .....8 Moss bank, Parkgate road

Higgins, F. W.....14 Egerton street
Hodge, Miss Isabel .....7 Hoole park
Holmes, Miss L. Freda .....Ashcroft, Hough green
Holmes, Miss Dorothy ..... ,, ,,
Holmes, Cedric ..... ,, ,,
Humphry-Williams, Lionel E. ..St. Mary's mount, Flint
Humphry-Williams, Miss Marjorie ,, ,,

Jones, Raymond .....Cliveden, Hough green
Jones, C. Brellisford.....Avoca, Garden lane
Jones, Miss Olive .....33 Cuppin street

Kind, R. Gordon .....Stoneby drive, New Brighton
Kirkland, Arthur .....c/o Mrs. Kenyon, Flookersbrook

Laybourne, John Oscar .....21 The Groves
Laybourne, Miss Florence Ada .. ,, ,,
Lockwood, Arthur W. C. .....Clovelly House, 28 Hamilton street
Lorimer, J. A. .....c/o Mr. A. E. Lovell, M.A., 75 Bouverie street
Lorimer, David ..... ,, ,, ,,

McKinlay, Miss Jeanie .....31 Cheyney road
Malcolmson, Miss Efra Florence..34 Hough green
Mann, Francis Alfred Wharton..18 Newgate street
Mann, Geoffrey Howard ..... ,, ,,
Miln, G. Gordon .....Magdalen College, Oxford
Miln, J. Douglas .....Milnholme, Brook lane
Miln, W. Wallace ..... ,, ,,
Miln, Miss Connie. ..... ,, ,,
Moore, Leslie .....60 Liverpool road
Moss, Miss Jennie .....50, Hough green

Nayler, J. L. .....4 Derby place, Hoole
Newman, F. C. .....Arnold House School

Paddock, Hubert .....Eton Villa, Cambrian road
Preston, Eric C. .....Abbot's Grange, Liverpool road

Siddall, Frank .....23 Eaton road
Simon, J. Malcolm .....4 Eastgate row
Simpson, Frank Burton .....10 Grosvenor street
Spencer, John Reginald .....19 West Lorne street
Storrar, James .....Newgate Street House
Storrar, Miss Ivy ..... ,, ,,
Storrar, Miss Violet..... ,, ,,

Tatler, Miss A.....16 Bouverie street
Thornton-Jones, Miss Sylvia ....The Queen's School
Trott, Miss Mary Catherine ....Manor House, Saighton
Turnock, Claude .....20 The Groves
Turnock, Miss Lilian D..... ,, ,,

Walley, Miss.....Lyncroft, Raymond street
Weaver, Thos. A.....Fern Cottage, Christleton
West, Miss Florence .....Lache Cottage
Welford, Miss .....5 Eastern pathway, Queen's park
Williams, Leslie .....26 Hough green
Williams, Miss Hilda ..... ,, ,,
Williams, Miss Carrie .....24 Hough green
Williams, Miss Marjory ..... ,, ,,
Williams, Miss Georgina..... ,, ,,
Williamson, Miss Annie .....Cuppin street
Wolfe, Miss Elsie.....Broomhurst, Newton
Wolfe, Miss Phyllis ..... ,, ,,
Wynne. Miss Hilda Mary.....49 Tarvin road

***** The Committee invite special attention to the Rule for admission of Junior Members, which is as follows: –**

> **"That Junior Candidates between the ages of twelve and "twenty-one shall be admitted, at a subscription of 2/6 "per annum, to all the privileges of the Society excepting "that of voting."**

**It is earnestly hoped that those parents who have boys or girls interested in Natural History will allow them to join the Society, under the auspices of this Rule.**

PRESENTED
BRITISH MUSEUM

CHESTER:
Printed by G. R. Griffith, "The Castle" Printing Works.

MDCCCCIX.

# CHESTER SOCIETY of NATURAL SCIENCE LITERATURE & ART

19 THIRTY-NINTH ANNUAL 19
0 REPORT & PROCEEDINGS 1
9 0

PRESIDENT GEORGE PEDDIE MILN ESQ.

GROSVENOR MUSEUM CHESTER

## THE LIBRARY

Is open to the Members Daily from 10 a.m. to 4 p.m.; and on Thursdays (from October to May) also from 6 p.m to 9-30 p.m.

☞ A copy of the New Library Rules is given on page 28.

⁂ The Catalogue of Books in the Society's Library may be obtained at 4, Eastgate Row; or from the Museum; price 3d. each.

☞ Copies of No. III. of the Society's Proceedings (Price 2/6); No. IV. (5/-); and No. V. (2/6); may be obtained at the Museum.

Nos. I. and II. are out of print.

*Special attention is directed to the following publications of the Society:—*

*(a) A List of Lepidoptera found in Cheshire, Flintshire, Denbighshire, Carnarvonshire, and Anglesea, compiled by* G. O. DAY *and others (Proceedings No. V.) Price* 2/6 *(Post free* 2/8*).*

*(b) "On some Rare Arachnids captured during* 1906," *by* A. RANDELL JACKSON, M.B., M.SC. *(Part I. of Proceedings No. VI.),* 1907. *Price* 6*d.*

Copies may be obtained from the Curator at the Museum.

# Chester Society

OF

# Natural Science, Literature, & Art

(FOUNDED BY CHARLES KINGSLEY 1871).

BRITISH MUSEUM
NATURAL HISTORY

# THIRTY-NINTH

# ANNUAL REPORT

INCLUDING

## STATEMENT OF ACCOUNTS, &c.

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# RULES.

1.—That the Title of this Society be "*The Chester Society of Natural Science, Literature, and Art,*" and that its objects be the promotion of the study of Natural Science, Literature, and Art, by Lectures, Field Meetings, the Reading and Discussion of Papers, and other suitable means.

2.—That the Officers be a President, Ten Vice-Presidents, Treasurer, One Scientific Secretary, Two General Secretaries, a Chairman and Secretary for each Section (nominated by the Section), and a Librarian.

3.—That the Committee consist of the above-named Officers, and of Twelve other members of the Society; and that the practical management of the Society be vested in such Committee, subject to the following Rules :—

4.—The name of any Candidate for Membership of the Society, with those of a proposer and a seconder, must be sent (in writing) to the Secretaries or Treasurer for the Committee, and shall be by them submitted for election at the next ensuing General Meeting; and when elected the Candidate shall become a Member upon payment of the Annual Subscription.

5.—That the Subscription be 5/- per annum, payable in advance, and due the 1st of May in each year. Any person duly elected may become a Life Member upon payment of £5.

6.—That Junior Candidates between the ages of 12 and 21 shall be admitted, at a subscription of 2/6 per annum, to all the privileges of the Society, excepting that of voting.

7.—That distinguished scientific men, or any persons who may render special service to the Society, may be elected Honorary Members, or Corresponding Members, on nomination by the Committee. The number of Honorary Members may not exceed thirty.

8.—A Member may introduce one friend at any of the Sectional Meetings. The Chairman and Secretary of each Section, may on application, allow a Member to introduce more than one friend to their own Sectional Meetings. Non-Members may be admitted to General or Sectional Meetings on payment of One Shilling each—except to the Annual General Meeting, to which Members only are admitted.

9.—That any Member desirous of withdrawing from the Society shall give notice (in writing) to either of the General Secretaries before the end of the financial year. In the absence of such written notice the Member shall be liable for the current year's Subscription, and all arrears.

10.—The names of Members whose Subscriptions are two years in arrears, after a final application has been made by the Secretaries or Treasurer, shall be erased from the list of Members, but still be held responsible for such arrears.

11.—A General Meeting shall have the power of expelling any Member whose conduct they deem objectionable, providing special notice has been given on the Society's Circular convening the Meeting, and that at least two-thirds of the Members present agree thereto.

12.—That the Committee shall meet monthly for the despatch of business. Five Members shall form a quorum.

13.—That the Committee shall arrange General Field Meetings during the year. The place of Meeting shall be fixed by the Committee, and due notice be given by the General Secretaries. In case of bad weather, the members of the Committee present shall decide whether such meetings be postponed or not.

14.—That the Committee shall also arrange at least six General Evening Meetings in the year, at which Papers shall be read and discussed. No Paper shall be read without the previous sanction of the Committee. Objects of scientific interest may be exhibited at these Evening Meetings.

15.—That the Annual General Meeting of the Society shall be held in the Month of May. At this Meeting the Officers and Committee of the Society, and two Auditors, for the ensuing year, shall be elected. If the number of nominations for any office exceeds the number of vacancies the election shall be by Ballot. The Officers' Reports and Financial Statement made up to the end of April, and duly audited, shall also be submitted, and read if desired.

16.—Nominations for the Committee and Auditors shall be sent (in writing) to either of the General Secretaries at least ten clear days previous to the Annual General Meeting.

17.—The names of all persons to be submitted to the Annual General Meeting as Officers and Committee, and also all Financial Statements and any proposed alterations of Rules, shall be posted on the Notice Board in the Vestibule of the Museum, at least six clear days previous to the Annual General Meeting, for the information of Members, who shall be apprised of such publication on the Notice convening the Meeting.

18.—The Committee shall fill any vacancy that may occur before the next Annual General Meeting.

19.—Any proposed alterations in the above Rules shall be notified to either of the General Secretaries at least ten clear days before the Annual General Meeting, and shall only be adopted if sanctioned by at least two-thirds of the Members present. No alteration in these Rules shall otherwise be made.

# Officers and Committee for 1910-1911.

## President:

GEORGE P. MILN, Esq.

## Vice-Presidents:

Prof. T. McKENNY HUGHES, F.R.S.
A. O. WALKER, Esq., J.P., F.L.S.
W. M. DOBIE, Esq., M.D., F.R.A.S.
T. SHEPHEARD, Esq., F.R.M.S.
G. R. GRIFFITH, Esq., J.P.
J. D. SIDDALL, Esq
Rev. A. H. FISH, B.A., B.Sc.
F. W. LONGBOTTOM, Esq., F.R.A.S.
A. HAMILTON, Esq., F.R.C.S., J.P.

## Officers of Sections:

### BOTANICAL.

Chairman—Mr. J. D. SIDDALL ... ... ... ... 23, *Eaton Road*
Secretary—Mr. A. E. GOODMAN ... ... ... ... *Laburnum Grange, Boughton*

### ZOOLOGICAL.

Chairman—Dr. W. HENRY DOBIE ... ... ... 2, *Hunter Street*
Secretary—Mr. W. F. J. SHEPHEARD, F.C.S. *Bridge Street Row*

### GEOLOGICAL.

Chairman—Mr. A. W. LUCAS, F.G.S. ... ... ... 4, *St. John's Road, Queen's Park*
Secretary—Mr. EGERTON GILBERT ... ... ... 21, *Eaton Road*

### NATURAL PHILOSOPHY.

Chairman—Mr. G. WATMOUGH WEBSTER, F.C.S. *Grange Road, West Kirby*
Secretary—Mr. J. BAIRSTOW, F.C.S. ... ... ... *Burley, Queen's Park*

### MICROSCOPICAL.

Chairman—Dr. J ELLIOTT, B.Sc. ... ... ... 24, *Nicholas Street*
Secretary—Mr. J. D. SIDDALL ... ... ... ... 23, *Eaton Road*

### PHOTOGRAPHIC.

Chairman—Mr. J. A. McMICHAEL, B.A., B.Sc. ... 39, *Parkgate Road*
Secretary—Mr. FRANK SIMPSON ... ... ... 10, *Grosvenor Street*

### LITERATURE.

Chairman—Rev. Canon F. W. SPURLING, M.A. ... 9, *King Street*
Secretary—Mr. J. MENTEITH GRAHAM ... ... 36, *King Street*

### ASTRONOMICAL.

Chairman—Dr. W. M. DOBIE, F.R.A.S. ... ... *Kirkton House, Hunter Street*
Secretary—Mr. F. W. LONGBOTTOM F.R.A.S. ... *Haslemere, Queen's Park*

### ART.

Chairman—The Very Rev. Dr. DARBY... ... ... *The Deanery*
Secretary—Mr. HORACE DAVIES, A.R.I.B.A., F.S.I. 14, *Newgate Street*

## Hon. Treasurer:

Mr. JOHN SIMON, 4, *Eastgate Row*

## Hon. Secretaries:

*Scientific*—Mr. F. W. LONGBOTTOM, F.R.A.S., *Haslemere, Queen's Park*
*General*— Mr. FRANK SIMPSON, 10, *Grosvenor Street*

## Hon. Librarian:

Mr. ALFRED NEWSTEAD, F.E.S., *The Grosvenor Museum*

## Committee:

The above Officers *(Ex-officio)*
AND

Miss BEATRICE CLAY, B.A.
Rev. J. L. BEDFORD, M.A., F.L.S.
Dr. J. R. CURRIE, M.A. (Oxon.)
Mr. J. DAY
Mr. J. LYON DENSON
Dr. H. DRINKWATER, F.R.S. (Edin.)
Dr. RANDELL JACKSON, D.Sc.
Mr. A. E. LOVELL, M.A.
Prof. R. NEWSTEAD, M.Sc., A.L.S., F.E.S.
Mr. P. H. OKELL
Mr. R. CECIL OWEN, B.Sc. (Lond.) F.C.S.
Dr. JAMES TAYLOR

## Hon. Auditors:

Mr. BERESFORD ADAMS
Mr. E. NOEL HUMPHREYS, F.C.A.

## Curator:

Mr. ALFRED NEWSTEAD, F.E.S., *The Grosvenor Museum*

## Assistant Secretary:

Mr. W. J. NEW

## Representatives of the Society upon the Governing Body:

Mr. GEORGE P. MILN
Mr. JOHN SIMON

# THE PRESIDENT'S INTRODUCTORY

AT

# THE ANNUAL GENERAL MEETING.

## THE LATE KING EDWARD VII.

Before commencing the business for which we are met to transact this evening, I would like, with your permission, to give expression to what is uppermost in the minds of all of us at the present time. We have no class or creed in our Society, but we yield to no one in our loyalty and attachment to the Throne of our country, and this loyalty and this attachment have been strengthened, if such were required, by the admiration we all held for His Majesty King Edward VII. His wise rule, his tactful judgment, and his wonderful insight into and in sympathy with all that was best in human nature, placed him on the very highest pinnacle of appreciation, by not only his own loyal subjects, but also by the inhabitants of the whole civilized world. We mourn his loss, and our full sympathies go out at this particular time to the Queen-Mother, whose practical sympathy with all good work, together with her wonderful charm of manner has so endeared her to the peoples of this realm. But in the midst of all this sorrow we look forward to the future with much hope to seeing in King George V. a worthy son following in the footsteps of a worthy Father. May God bless him and his Consort Queen Mary is, I am sure, the sincere wish of everyone in this assembly.

If it is your wish, Ladies and Gentlemen, that I, as President of this Society, should convey those sentiments to the proper quarters, I will ask you to signify the same by rising in your seats.

## THIRTY-NINTH

# ANNUAL REPORT.

With the advent of another year, our Society will have completed its fourth decade; this being the Thirty-ninth Annual General Meeting.

The present high state of its prosperity and efficiency is perhaps the best justification for its existence, and with the continued co-operation of its Members, it is sincerely wished that this high standard will long be maintained.

Altogether 98 new Members have been elected during the year, this being the largest addition to the Membership roll in any recent year; but, unfortunately, the losses by deaths, removals, and other causes, have almost been correspondingly heavy.

The present Membership of the Society stands at 1,028, which shews an increase of 13 over the total number of Members at the corresponding period of last year.

The transfer of the Grosvenor Museum Building to the City, to which reference was made in the last Annual Report, will take place on August 1st; after which date this Society, along with the Archæological Society, will become tenants of the Corporation.

Both Societies will, however, be represented on a Joint Committee, which will include representatives of the City Council, and which will have control of the building.

We have every reason to believe that these arrangements will work smoothly and satisfactorily to all concerned.

The Legacies from the late Mr. J. Eyton Williams, and the late Mrs. George Churton, have now been invested in Great Western Railway Company Stock, in the names of the following Trustees:—Messrs. George P. Miln, F. W.

Longbottom, John Simon, and Frank Simpson; and the revenue from these funds will be applied to the furtherance of the Society's work in the form of Lectures, Prizes, or Grants, as the Committee of the Society may, from time to time, think fit.

The following Excursions and Field Meetings took place during the Summer Session. A new feature of these was the introduction of several Excursions on Saturdays, to suit the convenience of those Members who are unable to attend the Excursions usually held on Wednesdays. This arrangement was much appreciated by those who took part, and it is proposed to carry out the Excursions for the present summer on the same lines.

## EXCURSIONS.

1909.

May 19th—Mollington Hall, for the Lake, Woods, and Gardens (by kind invitation of Mr. & Mrs. T. Gibbons Frost).

,, 22nd—Blacon and Saughall.

,, 26th—Delamere Forest and Meres.

June 9th—Legacy and Minera Mountain.

,, 16th—Shotwick Park, Woods, and Gardens (by kind permission of Wm. Vernon, Esq.)

,, 23rd—Geological Evening Field Meeting at Handbridge; for a study of the local Red Sandstone.

,, 26th—Rhydymwyn and "The Leete" (including a visit to the Gardens and Grounds of Colomendy, by kind invitation of Col. B. G. Davies-Cooke).

,, 30th—Evening Excursion to Kinnerton.

July 7th—Chirk, for the Castle and the Fishery (by kind permission of R. Myddelton, Esq., D.L., J.P.)—Annual Excursion.

,, 10th—Atchmere, Blakemere, and Delamere Woods.

,, 14th—Burton Point, for the Denhall Foreshore.

,, 28th—Navigation Cop and Sealand Marsh.

Sept. 1st—Holywell, for the Flannel and Tweed Mills (by kind invitation of H. F. Brown, Esq., LL.B.); St. Winefrede's Well, Basingwerk Abbey (by kind permission of Sir Pyers W. Mostyn, Bart.), and Wats' Dyke. A visit was also made to Holywell Parish Church (by kind permission of the Vicar, Rev. J. W. Thomas, M.A.)

1909

Sept. 8th—Horsley Hall and Gardens, Gresford (by kind permission of Alfred Ashworth, Esq., J.P., &c.).

„ 15th—Grosvenor Museum. The Collections of British Plants in bloom, as well as the Society's Zoological, Entomological, and Geological Collections, were described by the President (MR. G. P. MILN), PROF. R. NEWSTEAD, MR. A. W. LUCAS, MR. J. ARKLE, MR. J. THOMPSON, MR. F. SIMPSON, and the CURATOR (MR. ALFRED NEWSTEAD).

During the Autumn and Winter Months, General and Sectional Meetings were held as follows:—

## GENERAL MEETINGS.

1909.

Oct. 7th.—"Our Scottish Alps" (Special Lecture, "J. Eyton-Williams Lecture Fund").—W. LAMOND HOWIE, ESQ., F.R.S.E., F.C.S. (Scottish Mountaineering Club).

Illustrated by 140 Magnificent Views photographed by the Lecturer.

„ 28th.—Annual Conversazione in the Town Hall.

Nov. 4th.—"In South Germany."—MR. J. BAIRSTOW, F.C.S.

Illustrated by about 70 Lantern Slides.

Dec. 2nd—"The Woodlands of Wirral."—DR. C. THEO. GREEN, F.L.S.

Illustrated by some 150 Coloured Slides, shewing the Trees and Ponds, Flowers and Fungi observed by the Lecturer.

„ 6th—"Balloons, Airships, and Flying-Machines" (Afternoon and Evening Lectures).—MISS GERTRUDE BACON.

Illustrated by Lantern Slides, Flying Models of Airships and Flying Machines, and experiments illustrating the principles of Flight.

1910.

Feb. 3rd—"A Holiday in Greece."—MRS. H. F. BROWN, M.A.

Illustrated by 40 Lantern Slides.

March 3rd—"Some further observations on the Fauna of Jamaica."—PROF. ROBT. NEWSTEAD, M.Sc., A.L.S., &c.

Illustrated by Lantern Slides and Specimens.

„ 22nd—"Recent and Fossil Foraminifera; where to find, collect, and how to mount them"—Demonstration Lecture.—MR. J. D. SIDDALL.

Illustrated by Lantern and Microscopes. This Lecture was given by request of Mr. T. Shepheard, F.R.M.S., who offers a Prize of Five Pounds to Members for the best Collection of Recent and Fossil Foraminifera.

April 7th—"The Life of Josiah Wedgwood" (under the auspices of the Section of Arts and Crafts).—Paper by MRS. J. H. HOPLEY, and kindly read on her behalf by MR. HORACE DAVIES (Secretary of the Section).

Illustrated by Specimens of Wedgwood Ware.

1910.

April 21st—Grosvenor Museum. The following Gentlemen gave short Addresses on some of the Exhibits in the Museum :—

The Collections of Native Plants.—MESSRS. A. E. GOODMAN, and S. STENDALL (Assistant Curator).

The Geological Specimens, consisting of Animal Remains from the Caves of North Wales, Footprints of extinct Bratrachians, Carboniferous Fossils, &c., &c.—MR. WM. SHONE, F.G.S.

The Mammals, Birds, Reptiles, and Fishes.—MR. A. NEWSTEAD F.E.S. (Curator).

The Moths and Butterflies.—MESSRS.. J. ARKLE and J. THOMPSON.

*Special Afternoon Lectures, for Members and Junior Members of the Society and the public in general.*

1909.

Dec. 29th—"The Story of Chester."—MR. JAMES WILLIAMS.

Illustrated with Lantern Slides.

1910.

Feb. 9th—(By special request) "Halley & Halley's Comet."—MR. F. W. LONGBOTTOM, F.R.A.S.

Illustrated with some specially made Lantern Pictures.

MISS MURIEL KEELL kindly recited "Applied Astronomy," *(Anon)*, and De Quincey's translation of the "Dream of Infinity."

„ 23rd—"The Chester Historical Pageant 1910" (by arrangement with the Lecture Committee of the Chester Pageant).—MR. FRANK SIMPSON.

Fully illustrated with specially made Lantern Slides.

1909.

Nov. 1st to 8th (both inclusive)—Exhibition in the Art Gallery of the Kingsley Memorial Nature Study Prize Competitions. There was also on view, during the same period, the further series of Coloured Studies of Wild Flowers (natural size), executed during the year from actual specimens by DR. H. DRINKWATER, F.R.S. (Edin.).

## SECTIONAL MEETINGS.

### BOTANICAL SECTION.

1909.

Oct. 14th—"The Ecology of the Seashore."—MR. J. LLOYD WILLIAMS, D.Sc. (University College of North Wales).

1910.

Jan. 20th—"Nature among the Sand-Dunes."—MR. A. A. DALLMAN, F.C.S. (Hon. Secretary Liverpool Botanical Society).

Illustrated by about 100 Lantern Slides by the Lecturer.

## ZOOLOGICAL SECTION.

1909.

Nov. 25th—"Protective Resemblance and Mimicry."—DR. A. RANDELL JACKSON, M.B., D.Sc.

Illustrated with Lantern Slides.

1910.

Feb. 24th—Zoological Notes and Observations on the past year, contributed by the following Members:—THE CHAIRMAN (DR. W. H. DOBIE), MR. J. ARKLE, DR. JACKSON, MR. C. K. SIDDALL, MR. J. THOMPSON, THE CURATOR, and others.

Notes on some rare and new additions to the Society's Collections by THE CURATOR (MR. ALFRED NEWSTEAD).

A magnificent Specimen of the Osprey was exhibited.

Several of the contributions were illustrated by Lantern Slides.

## GEOLOGICAL SECTION.

1910.

Jan. 27th—"The River Alyn."—MR. HERBERT A. HATCH, M.Sc.

Illustrated with Lantern Slides.

Mar. 31st—"Life's Failures."—MISS E. G. SKEAT, D.Sc.

Illustrated with Lantern Slides.

## NATURAL PHILOSOPHY SECTION.

1909.

Oct. 21st—"The Self-Purification of Rivers."—MR. W. D. SCOULLER, B.Sc., F.C.S.

Illustrated by Diagrams, &c.

1910.

Feb. 10th—"The Weight of the Earth: and how it has been ascertained." MR. R. CECIL OWEN, B.Sc., F.C.S.

Illustrated by Lantern Slides.

## MICROSCOPICAL SECTION.

1910.

April 28th—Paper on "The preparation of Insects for Microscopical Examination."—PROF. R. NEWSTEAD, M.Sc.

Some preparations of the mouth-parts of the common house-fly were distributed to working Members.

Demonstration of High-Power Dark-Ground Illumination.—MR. MICHAEL JOHNSON.

Exhibition of some rare Diatoms, including *Aulæodiscus Superbus*.—MR. JOSEPH DAVIES.

Demonstration of Micro-Photography of Seeds of British Plants.—MR. ALFRED NEWSTEAD.

Account of the succession of Life in Troughs kept through the winter.—MR. J. D. SIDDALL.

## PHOTOGRAPHIC SECTION.

1909.
Nov. 11th—"A visit to the English Cathedrals."—MR. FRANK SIMPSON.
Lecture supplied by The Affiliation of Photographic Societies; illustrated by a large number of prize slides.

Dec. 17th—A Working Demonstration on the Autotype Carbon Process.—MR. W. ERNEST BROWN.

1910.
Feb. 17th—LECTURETTES (illustrated by Lantern Slides):—
"Under Canvas at Deganwy," being a resumé of the camping experiences of the City and County School for Boys.—MR. J. A. MCMICHAEL, B.A., B.Sc., Head-Master.
NATURAL HISTORY PHOTOGRAPHY—"Birds and their Nests, and Flowering Plants."—MR. ALFRED NEWSTEAD, F.E.S. (Curator). "Trees in Winter."—MR. J. A. S. STENDALL.

Mar. 18th—"Lantern Slide Making."—MR. FRANK SIMPSON.

## LITERATURE SECTION.

1909.
Dec. 9th—"A Day in Rome in the First Century, A.D."—REV. CANON F. W. SPURLING, M.A.

1910.
Mar. 10th—"The Life and Works of Jane Austen."—REV. WILLIAM PORTER, M.A., D.LITT. (of Bala).

April 14th—"The Turkish Nation."—MR. J. MENTEITH GRAHAM.

## ASTRONOMICAL SECTION.

1909.
Dec. 16th—"The Astronomy of the Pole."—W. E. PLUMMER, ESQ., M.A., F.R.A.S. (Director of Bidston Observatory).

1910.
Mar. 17th—Popular Lecture—"Why is the Sky Blue?"—MR. R. CECIL OWEN, B Sc. (Lond.), F.C.S.
Illustrated with Lantern Slides.

There have been in all 14 Committee Meetings during the year for the transaction of business, and as far as lies in the power of the Members of this body, they have endeavoured to promote the true interests for which the Society exists, and they hope their efforts have met with the appreciation of the Members at large.

FRANK SIMPSON,
*Hon. Secretary.*

W. J. NEW,
*Assistant Secretary.*

GROSVENOR MUSEUM,
MAY 19th, 1910.

# PRESIDENT'S ADDRESS

## (AFTER RE-ELECTION).

Ladies and Gentlemen,

It is my duty to thank you and I do so very sincerely for the honour you have just done me in re-electing me as your President for another year. Twelve months ago when you did me this great honour, which was both unexpected and unsought, I felt conscious of my unfitness to follow in the footsteps of so many able men, and I doubt if my recent experience has in any way made me better qualified for this high position. It is, however, gratifying to find that we have during the year more than held our own; and that the Society has, in several ways, made distinct progress. Our membership has increased; and the activities of the various sections during the Winter Session, and also at the Field Meetings and Summer Excursions have been very encouraging. There is also a renewed interest being taken in the Microscopical Section, which is an excellent sign, for after all it is here, perhaps, that the bedrock of the Society lies. The present occasion is, therefore, peculiarly suitable for honouring one with the award of the Kingsley Memorial Medal, who has for many years done so much valuable work in connection with this Section. To my mind no one more deserves this honour than does our co-worker, MR. MICHAEL JOHNSON.

Another gratifying feature of the Society's work is the keen interest that is being taken in Natural Science by the Junior Members of the Society; and I believe this is a sure indication—I should almost say, a *sure guarantee*—for the continuance of the work that has been so well done during the past 40 years. To those who are so willingly helping these young enthusiasts in the Saturday afternoon Excursions, and in various other ways, our grateful thanks are due; and in the days and years that are to come, I feel sure, they will have their reward. Here we might well quote the words of the Poet who writes :—

> "And Nature, the old nurse, took
> The Child upon her knee,
> Saying, 'Here is a story book
> Thy Father hath written for thee;
> Come wander with us,' she said,
> 'Into the regions yet untrod,
> And read what is still unread,
> In the manuscripts of God.'"

That these regions are being trod by our young scientists is proved by the excellent displays of Native Plants and other exhibits made during the Spring, Summer, and Autumn months, in the Art Gallery of this building. The legacies left to the Society by the late MR. J. EYTON WILLIAMS and by the late MRS. GEORGE CHURTON will enable us to do still more in this direction. May more such legacies follow. In a wider sense we can almost claim to be pioneers in the encouragement of Nature Study amongst juniors throughout the County of Cheshire, and also in North Wales. By no less an authority than the head of the department of this branch of educational work at the Board of Education in London, we have been held up as a worthy example for other Societies to follow. This work has also, I know, been appreciated by many of the scholastic bodies throughout Cheshire and North Wales.

A year ago I pleaded for the upholding and carrying on of the work begun here by Kingsley when he founded this Society, and I feel I cannot do better than repeat my pleadings uttered upon that occasion. I would ask you to remember the high ideals of our Founder. Think and ponder over the work of those who have been the corner-stones of this great Society: PROFESSOR MCKENNY HUGHES, the late DR. STOLTERFOTH, ALFRED O. WALKER, J. D. SIDDALL, GEORGE SHRUBSOLE, WM. SHONE, THOS. SHEPHEARD, ARTHUR FISH, ROBERT NEWSTEAD, and others, who have shown us such excellent examples in carrying on this work, and upholding the excellent traditions of this Society, of which we all feel so justly proud.

In our last Annual Report, a brief reference was made to the proposed transfer of this building to the City Corporation, and in the very near future, on the 31st day of July, it is now proposed that this transfer will actually take place. This new departure is quite in keeping with modern ideas of Municipal Government, and will, I feel sure, be to our advantage as a Society, and at the same time prove to be a great gain for the Citizens of Chester. Although we are only one of several bodies who occupy this building, I believe I am right in stating that but for this Society the Grosvenor Museum might never have existed. I believe, I am right in saying that the classes and schools and building are the direct outcome of the classes established by the Natural Science Society in 1872, before the Museum was built. This Institution was once appropriately described by one who contributed largely to the cost of its building, and for a long time took a deep interest in all its work as a "Local University successfully carried on without any cost to the City." Erected

and equipped at a cost of some £25,000, without any burden on the rates of the City, its possession by the Citizens will, I feel sure, be fully appreciated by them, and looked upon as a legacy worth possessing. The value of it as a local University is proved by the fact that the number of students who actually pass through the various classes average more than a thousand per annum; added to which is the membership of our own . ociety, including the membership of the Archæological Society; and if you include the Paxton Society, whose head-quarters are also here, you get somewhere about 3,000 names associated with the Institution. It is to the munificence of the late DUKE OF WESTMINSTER and other leading Citizens that the erection of the structure is due. It is to the enthusiasm and self-sacrifice of many others who have, year in and year out, carried on the excellent work to whom Chester will ever be indebted. But if the City has been morally and intellectually better for all this work, it will not have been done in vain.

## SCIENTIFIC REPORT.

THE Society has passed through another year of steady progress in the Natural Sciences, and has again established a record in the number of its Members. This very necessary feature, the growth in numerical strength, may sometimes suggest a possibility of quantity increasing rather than quality; but in this connection it is well to remember that when the Society only totalled some 300 Members, Charles Kingsley, who was then its President, openly deplored the small percentage of actual workers it contained. It is always difficult to apply any reliable test in this matter, as much valuable work is done quietly; but a review of the solid results accomplished during the past twelve months suggests a favourable comparison with any year since the Society's foundation.

Conspicuous amongst the achievements of the year is the steady development of the Society's Museum, the newer exhibits including Mr. Alfred Newstead's Case illustrating the life-history of the Cuckoo, and many interesting additions to the collections of *Lepidoptera*, &c., made by our leading entomologists.

The prominence which the scientific world has given during recent years to the study of Mycology justifies a reference to the work being done by our colleague, Mr. Joseph Thompson. The collections of local Fungi, shown by Mr. Thompson at our Conversaziones, are well known, but they can only give a faint idea of the importance of his researches; and it is hoped, one day, that the Society may be able to publish some of his valuable results.

Increased interest has been shown in the Society's Library, which is growing into quite useful proportions.

In Botany, Entomology, Geology, and Ornithology, most of the best-known Classics can be consulted.

The Society possesses two Microscopes and two Astronomical Telescopes, which can be used by Members; and it is hoped that these privileges will be more and more valued.

The Sections have continued their useful career, and the attendance at the Lectures has been well above the average. The marked increase in the vitality of the Microscopical Section is especially gratifying, and it is a matter for congratulation that the instrument which has had so much to do with the existence of the Society is again commanding the attention of a wider circle of our workers. The award of the Kingsley Memorial Medal to one of the most distinguished microscopists in the district (Mr. Michael Johnson) has given universal satisfaction.

The Section devoted to Literature has had an encouraging Session; and that belonging to Arts and Crafts proposes to follow up its year's endeavour by holding an Exhibition during the coming Autumn.

The urgent desire expressed on all sides for an early revival of the Society's "Proceedings" is a proof that our Members are still actuated by a genuine scientific spirit; and it is hoped that our funds will soon permit us to offer to the many Societies who so generously exchange their publications with us, a fairer return for their necessary and much appreciated support.

F. W. LONGBOTTOM.

# The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art, for the Year ending April 30th, 1910.

| Dr. | £ s. d. | £ s. d. |
|---|---|---|
| By 836 Subscriptions for year 1909-10 at 5/- ... ... (835 for 1909-10; one for 1910-11) | 209 0 0 | |
| ,, 25 Arrears for year 1908-9 at 5/- ... ... ... | 6 5 0 | |
| | | 215 5 0 |
| ,, 98 Junior Subscriptions for 1909-10 at 2/6 ... ... | | 12 5 0 |
| Subscriptions unpaid— | | |
| 47 for 1909-10 at 5/- ... ... | £11 15 0 | |
| 6 Juniors for 1909-10 at 2/6 ... | 0 15 0 | |
| ,, Gross Receipts from Excursions— | | |
| Mollington Hall ... ... ... ... | 3 6 9 | |
| Legacy and Minera Mountain ... ... | 2 15 1½ | |
| Shotwick Park ... ... ... ... | 0 15 3 | |
| Rhydymwyn and The Leete ... ... | 4 4 6 | |
| Chirk Castle and Fisheries (Annual Excursion) ... ... ... | 9 2 9 | |
| Atchmere and Blakemere ... ... ... | 1 15 9 | |
| Burton Point ... ... ... ... | 0 10 0 | |
| Holywell (for the Flannel and Tweed Mills, &c.) ... ... ... ... | 5 17 6 | |
| Horsley Hall, Gresford ... ... ... | 2 14 3 | |
| | | 31 1 10½ |
| ,, Gross Receipts from Conversazione... ... ... | | 12 9 2 |
| ,, ,, ,, Lectures and Sectional Meetings | | 12 10 0 |
| ,, Transferred from "J. Eyton Williams" Fund for Special Lecture ... ... ... ... | | 5 5 0 |
| | | 288 16 0½ |
| Balance to next Account ... | | 16 1 6 |
| | | £304 17 6½ |

| Cr. | £ s. d. | £ s. d. |
|---|---|---|
| To Balance from last year ... ... ... ... | | 8 1 6½ |
| ,, Museum Management Committee ... ... | | 75 0 0 |
| ,, Natural History Museum and Library ... ... | | 22 5 11 |
| ,, Postages ... ... ... ... ... ... | | 37 2 10 |
| ,, Printing, Stationery, and Advertising ... ... | | 66 10 6 |
| ,, Expenses in connection with Excursions:— | | |
| Mollington Hall ... ... ... ... | 2 18 0 | |
| Legacy and Minera Mountain ... ... | 2 8 7 | |
| Shotwick Park ... ... ... ... | 0 14 4 | |
| Rhydymwyn and The Leete ... ... | 3 12 0 | |
| Chirk Castle and Fisheries (Annual Excursion) ... ... ... ... | 8 19 6 | |
| Atchmere and Blakemere ... ... ... | 1 15 9 | |
| Burton Point ... ... ... ... | 0 7 0 | |
| Holywell (for the Flannel and Tweed Mills, &c.) ... ... ... ... | 4 19 6 | |
| Horsley Hall, Gresford ... ... ... | 2 10 6 | |
| | | 28 5 2 |
| ,, Expenses in connection with Lectures, Evening Meetings, &c.:— | | |
| Conversazione ... ... ... ... | | 19 8 4 |
| Fees to Lecturers ... ... ... ... | | 17 17 0 |
| ,, Salary to Assistant Secretary ... ... ... | | 15 0 0 |
| ,, Subscriptions:— | | |
| Ray Society ... ... ... ... | 1 1 0 | |
| Royal Photographic Society ... ... | 1 1 0 | |
| Palæontographical Society ... ... ... | 1 1 0 | |
| | | 3 3 0 |
| ,, Lantern Account ... ... ... ... ... | | 11 5 0 |
| ,, Collecting outstanding Subscriptions ... ... | | 0 15 0 |
| ,, Bank Commission ... ... ... ... | | 0 3 3 |
| | | £304 17 6½ |

Examined with the Accounts and Vouchers relating thereto and found to be correct, showing a balance due to the Hon. Treasurer of £16 1s. 6d.

BERESFORD ADAMS,
E. NOEL HUMPHREYS, F.C.A., } Hon. Auditors.

CHESTER, 13TH MAY, 1910.

JOHN SIMON, Hon. Treasurer.

# LEGACIES ACCOUNT.

**Dr.** The Hon. Treasurer in Account with the Chester Society of Natural Science, Literature, and Art. **Cr.**

| 1909. | £ s. d. | £ s. d. |
|---|---|---|
| May 5th—To Balance in Bank (as per previous statement) | 500 10 4 | |
| „ Bank Interest to date of purchase of Stock (as on other side) ... ... ... | 3 3 11 | |
| | | 503 14 3 |
| | | £503 14 3 |
| 1910. | | |
| Feb. 28th—To Balance brought down ... ... ... | | 4 1 3 |
| „ Dividend on Investment... ... ... | | 13 3 8 |
| | | £17 4 11 |
| May 10th—Balance in Bank ... ... ... ... ... | | £11 19 11 |

| 1909. | £ s. d. | £ s. d. |
|---|---|---|
| Sept. 11th—Paid for £400 Great Western Railway Company's Consolidated Ordinary Stock ... | 494 10 0 | |
| Broker's Commission, Transfer, &c. ... | 5 3 0 | |
| | | 499 13 0 |
| Balance ... ... ... | | 4 1 3 |
| | | £503 14 3 |
| Transferred to General Account by sanction of Committee for Special Lecture ... | | 5 5 0 |
| Balance ... ... ... | | 11 19 11 |
| | | £17 4 11 |

13th May, 1910—Examined and found correct.

We have inspected the Certificate for the £400 Great Western Railway Consolidated Ordinary Stock, in which the investment has been made.

JOHN SIMON, HON. TREASURER.

BERESFORD ADAMS,
E. NOEL HUMPHREYS, F.C.A., } HON. AUDITORS.



# "KINGSLEY MEMORIAL" FUND.

## Statement of Accounts for the Year ended 30th April, 1910.

| 1909-10. | £ s. d. | £ s. d. |
|---|---|---|
| To Balance from last Account ... ... ... ... ... | 5 8 7 | |
| „ Dividends on Great Western Railway Consolidated Ordinary Stock (less Income Tax) ... ... ... ... | 14 17 1 | |
| „ Repayment of Income Tax for 3 years ... ... ... | 2 9 8 | |
| | | £22 15 4 |
| To Balance in Bank ... ... ... ... ... ... | £1 2 3 | |

| 1909-10. | £ s. d. | £ s. d. |
|---|---|---|
| By Prizes awarded as follows:— | | |
| Messrs. H. A. Hatch, M.Sc., and J. A. S. Stendall ... | 4 4 0 | |
| Miss Humphry-Williams ... ... ... ... | 2 2 0 | |
| Mr. C. K. Siddall ... ... ... ... | 2 2 0 | |
| „ Amount paid for Junior Prizes ... ... ... ... | 7 14 6 | |
| „ Printing Account ... ... ... ... ... | 2 14 6 | |
| „ Account for Certificates of Merit ... ... ... ... | 2 12 6 | |
| „ Engraving Medal for 1909 ... ... ... ... | 0 2 0 | |
| „ Bank Commission ... ... ... ... ... ... | 0 1 7 | |
| Balance ... ... ... ... ... | 1 2 3 | |
| | | £22 15 4 |

16th May, 1910—Examined and found correct,

GEORGE P. MILN, HON. TREASURER.

P. H. OKELL, AUDITOR.

## CURATOR AND LIBRARIAN'S REPORT.

DURING the past Session, your Curator is pleased to state that the Society's Library and Museum has been enriched by a number of valuable and important additions.

A specimen of the Leisler's Bat *(Pierygistes leisleri)*, shot by MR. J. W. PERCIVAL, at Bowdon, on July 23rd, 1909, has been presented by MR. T. A. COWARD. This is the third example recorded for Cheshire.

This species closely resembles the Noctule Bat, but is distinguished by several well-marked characteristics. The Donor says that its habit of flight is usually at a higher elevation than that of the Noctule, and in a zig-zag fashion.

On the estate of R. T. RICHARDSON, ESQ., J.P., Capenhurst, near Chester, a very fine adult female specimen of the Osprey *(Pandion haliætus)* was captured, on May 7th, 1909, by the Gamekeeper, from whom it was subsequently acquired by the Society.

A number of specimens have been observed in the County at various times ("Fauna of Cheshire," Coward and Oldham). These, however, were invariably immature individuals, and were usually taken on the Spring and Autumn migration.

It is owing to special protection of this bird in Scotland that it has persevered so long as an indigenous British species.

An immature specimen of the Long-tailed Duck, presented by the late LIEUTENANT-COLONEL CONGREVE, V.C., is worthy of special comment, being new to the Society's collection, and one of comparatively few specimens recorded from Cheshire.

Another new and rare addition is a Great Northern Diver *(Colymbus glacialis)*, presented by MR. R. FORSTER, by whom it was shot on the Helsby Marshes, on December 21st, 1891, during extensive floods. This species occurs very rarely in the County, and only as a winter visitor.

A Life-history Group of the Cuckoo has been prepared by the CURATOR from material and specimens collected in the County. The nest contains an almost fully-fledged young Cuckoo. A clutch of three eggs of the foster-parent (the

Hedge-sparrow), together with one egg of the Cuckoo, are also exhibited in the same Case.

On October 18th, 1909, in the Dee, between Connah's Quay and Flint, a specimen of the fifteen-spined Stickleback *(Gasterosteus spinachia)* was captured by a fisherman, from whom it was purchased by the Society. Apparently, this is the first record from the Dee since Byerley's time (about fifty years ago), though it has been taken more recently in the Mersey. The only other specimen in the Society's Museum was taken in the Mersey, in 1882, by PROFESSOR R. NEWSTEAD. Though common on the coast, this marine Stickleback rarely ascends rivers, and is seldom, if ever, taken in fresh water.

A specimen of the Lumpsucker Fish *(Cyclopterus lumpus)*, presented by MR. J. BAIRSTOW, is worthy of note.

MR. J. ARKLE has presented several interesting species of *Lepidoptera*, one of which is deserving of special comment, viz.: *Epunda viminalis*. The CURATOR has also added many scarce species taken at the electric lights in this City.

The Society have purchased a very fine example of the molar-tooth of the Mammoth *(Elephas primigenius)*, believed to be the only authentic Cheshire example; also antlers of the Red and Fallow Deer; and the frontal-bone and horn-cores of *Bos primigenius*. These have been collected at various times in the Runcorn district from the peat and alluvium deposits.

The thanks of the Society are due to DR. SMITH WOODWARD, of the British Museum, and MR. W. SHONE, for the identification of these interesting additions.

DR. H. GRILLS, of the County Asylum, has presented a very interesting geological specimen, found by him in a field near the County Asylum, Upton, 1909.

MR. WM. SHONE, who kindly forwarded the specimen to the British Museum, has furnished the Society with the following note by DR. W. ANDREWS:—"The mineralogist says that the outer crystalline part is quartz; the inner lining chalcedony; and suggests that it may be formed round part of the tube of a Teredo (marine mollusc)."

Your Curator has very much pleasure in stating that the exhibition of living wild plants, initiated three years ago, has not only met with marked success, but has proved of great educational value to a large number of Members of the Society, and also to the general public. Your Curator wishes in this communication to express to the Contributors his warm appreciation for the valuable and interesting plants which they have contributed from time to time towards this exhibition. Without such help it would have been quite impossible to have made such a thoroughly representative display of the living flowers of our country; and your Curator expresses the hope that he may receive the same kind assistance in the future that he has done in the past.

It may be interesting to add that during the year 1909 no less than 500 species of plants were exhibited, representing, approximately, 2,500 individual specimens.

In connection with this exhibit, it has been thought desirable to form a collection of the seeds of British Plants, and your Curator has already placed on view a series of micro-photographs illustrative of this interesting phase of Botany.

By invitation of the Museum Management Committee, arrangements have again been made for a series of "Nature-Study Lessons," on six subjects, commencing April 11th, ending on or about September 9th, 1910, to Classes of the City Public Elementary Schools, given by the Curator.

The subjects approved by the Director of Education are as follows:—

(1) The Stoat; Weasel; and Polecat
(2) The Frog and Toad
(3) Familiar Wild Birds
(4) Bees and Wasps (social and solitary)
(5) The Life-histories of some common Flowering Plants
(6) Fossil Animals and Plants.

The total number of attendances—at an average weekly attendance of 70—is 1,260. Specimens in the Society's Museum, lantern photographs, and living specimens, are used to illustrate the lessons.

## ADDITIONS TO THE SOCIETY'S MUSEUM.

Mr. J. Arkle—5 species, 13 specimens, *Lepidoptera.*

Mr. J. Bairstow—Lump Sucker (*Cyclopterus lumpus*).

Mr. Clifford E. Burton—Viper.

Mr. Stuart Clark—*Anthrocosia* (sp. ?), Coal-measure shales.

The *late* Lieutenant-Colonel Congreve—Immature Long-tailed Duck; Pied variety of Blackbird.

Mr. T. A. Coward—Leisler's Bat; immature Male Scoter.

Colonel B. G. Davies Cooke—Two embryo nests of *Vespa Britannica.*

Curator—4 species, 14 specimens, *Lepidoptera;* Lesser Redpoll.

Mr. R. Forster—Great Northern Diver.

Mr. W. F. Lowe—Puffin (down).

Mr. Matheson—Collection of 58 specimens of Ferns (India); accepted for teaching purposes.

Mr. Ferris Neare—Lesser Shrew.

Mr. J. W. Roberts—2 Minnows; 6 Welsh Charr.

Mr. S. Stendall—10 species of Birds (skins).

Mr. J. Thompson—Viper.

Mr. J. Weaver—Bullfinch.

Mr. D. Williams—Fork-tailed Petrel.

Mr. C. Williams—Kingfisher.

Miss Wray—Nest of Ground Wasp (*Vespa vulgaris*).

Purchased—15-spined Stickle-back.

Purchased—Osprey.

## ADDITIONS TO THE SOCIETY'S LIBRARY 1909-10.

(Marked * are by exchange)

Arachnids, Rare, obtained during 1908; A. R. Jackson. *Donor*, The Author.

*Ashmolean Natural History Society of Oxfordshire—

Reports and Proceedings, &c.

Proceedings and Report, with a supplementary list of Coleoptera, 1909.

Astronomie Populaire, 1881, Par Camille Flammarion. *Donor*, Alderman Egerton Gilbert.

*Barrow Naturalists' Field Club, Reports and Proceedings, Vol. XVII.,1909.

*Bournemouth Natural Science Society, Vol. I., 1908-9.

*Bristol Naturalists' Society, Proceedings of, Vol. II., Part 11, 1908.

*British Association for the Advancement of Science (Winnipeg Meeting), Report of, 1909.

*Brooklyn Institute of Arts and Sciences—

Vol. I., No. 15, 1909.

New Coleoptera, chiefly from Arizona; C. Schaeffer.

New Birds from Orinoco region, and from Trinidad, 1909; C. K. Cherrie.

*Cardiff Naturalists' Society, Transactions of, Vol. XLI., 1908.

Cardiff Museum of Natural History, Arts and Antiquities, Report of, 1909.

Cartography of the Counties of England and Wales, Notes on; H. G. Fordham, 1908. *Donor*, The Author.

Chester Society of Natural Science, Literature, and Art, 38th Annual Report, 1908-9.

Chemical Society, Journal of, 1909-10. *Donor*, Mr. W. F. J. Shepheard.

Cone of Calamostachys Binneyana (Carruthers) attached to a leafy shoot; H. H. Thomas, 1909. *Donor*, The Author.

*Colorado Studies, University of, U.S.A.—

Vol. VI., No. 3, 1909.

Vol. VII., Nos. 1—3, 1909-10.

*Colchester Museum of Local Antiquities, Report of, 1909-10.

Dorset Natural History and Antiquarian Field Club, Vol. XXX., 1909. *Donor*, Mr. Thos. Shepheard.

Dublin Institution of Science and Art, Reports on, 1907-8.

Dublin National Museum of Science and Art, General Guide, &c., 1909.

*Ealing Scientific and Microscopical Society—

Reports and Transactions, 1908-9.

"Entomologist," 1909-10. By purchase.

*"Essex Naturalist"—

Vol. XV., Parts 4—8, 1908-9.

Vol. XVI., Parts 1 and 2, 1909.

Flora of the West of Ireland, Tourists, R. Ll. Praeger, 1909. *Donor*, Mr. C. W. Rogers.

Flora of Flintshire, Notes on, 1910; A. A. Dallman. *Donor*, Curator.

Geological Survey, Memoirs of, England and Wales—

Geology of the neighbourhood of Chester; Aubrey Strahan.

Geology of the neighbourhoods of Flint, Mold, and Ruthin, 1890; A. Strahan (with notes by C. E. de Rance). *Donor*, Dr. A. Strahan.

Geology of the country around Prescot, Lancashire; description of quarter-sheet, 80 N.W., and corresponding six-inch Maps, Nos. 107 and 108 (Lancashire), 1882; E. Hull; 3rd Edition, with additions, by A. Strahan. *Donor*, Dr. A. Strahan.

Geology of the neighbourhood of Chester (explanation of quarter-sheet, 80 S.W.), 1882; A. Strahan. *Donor*, The Author.

Geology of the Coasts adjoining Rhyl, Abergele, and Colwyn (explanation of quarter-sheet, 79 N.W.), 1885; A. Strahan (with notes by R. H. Tiddeman). *Donor*, The Author.

*Geologists' Association, London, Proceedings of, Vol. XXI., Parts 2—7, 1909-10.

"Geographical Journal," 1909-10. By purchase.

Germ Cells, 1905; W. T. Haydon. *Donor*, Curator.

"Glasgow Naturalist," Vol I., Parts 1—4, 1908-9.

Glasgow Museum and Art Galleries, Report of, 1909.

Godlee Observatory, Report of, 1909.

Hawaii, Report of Division of Entomology of Board of Agriculture and Forestry, Territory of, 1908.

Horniman Museum and Library, Seventh Annual Report, 1908.

*Hull Museum Publications—

Guide to Municipal Museum, 1909.

Quarterly Record of Additions, 1909-10.

Ipswich, Annual Report of Museum and Free Library, 1909.

Kelvin's (Lord) Early Home, Recollections of his sister, the late Mrs. Elizabeth King; together with some family letters and a supplementary chapter by the Editor, Elizabeth Thomson King, &c. 1909. *Donor*, Mr. Thos. Shepheard.

*Lancashire and Cheshire Entomological Society, Report of, 1909.

Lancashire, Cheshire, and North Wales Coasts, Battle of Land and Sea on, 1909; W. Ashton. *Donor*, Mr. F. W. Longbottom.

Leicester Museum and Art Gallery, Report of, 1908-9.

*Liverpool Naturalists' Field Club, Proceedings of, 1909.

*Liverpool Geological Society, Proceedings of, 1908-9.

*Liverpool Botanical Society, Transactions of, Vol.-I., 1909.

*Liverpool Astronomical Society, Report of, 1909.

*Liverpool Observatory, Bidston, Report of the Director to the Marine Committee, and Meterological Results deduced from the Observations taken at, 1908.

*Llandudno and District Field Club, Proceedings of, 1907-8.

*Lloyd Library, Bulletin, No. 11, 1909.

*Manchester Entomological Society, Seventh Report of, 1909.

*Manchester Microscopical Society, Annual Report and Transactions of, 1908.

Maidstone, Guide to the Collections in the Museum and Bentlif Art Gallery, with notes on the History of Chillington Manor House, 1909.

*Mexico, Parergones Instituto Geologico de, Vol. II., No. 2—10, 1909.

Metazoa, "Biogenetic Law" considered in relation to an Antithetic alternation of Generations in the, 1907; W. T. Haydon. *Donor*, Curator.

*Missouri Botanical Garden, Twentieth Report, 1909.

*Montana, University of—

Register, 1908-9.

Psychology of Skill; W. F. Book.

President's Report, 1907-8.

"Museums' Journal," 1909-10.

"Naturalist," 1909-10. By purchase.

"Nature," 1909-10. By purchase.

New Zealand Institute, Proceedings and Transactions, 1908-9.

*Northants Natural History Society and Field Club, Journal of, Vol. XIV., 113-116, 1908; Vol. XV., Nos. 117-120, 1909.

Northumberland, Durham, and Newcastle-upon-Tyne, Report of. *Donor*, Dr. R. Jackson.

*Nottingham Naturalists' Society, Report and Transactions, 1908-9.

Norwich Castle Museum, Report of, 1909.

Norwich Museum Association, Report of, 1908-9.

Palæontographical Society, Vol. LXIII., 1909. By purchase.

Photographic (International) Survey of the Sky, 1909; A. Bellamy. *Donor*, The Author.

*Pinus Sylvestris*, Seed production of, 1907; W. T. Haydon. *Donor*, Curator.

Ray Society, British Freshwater Rhizopoda and Heliozoa, 1909; J. Cash. By subscription.

Royal Astronomical Society, Memoirs of, Vol. LIX., Part 3 and 4, 1909. *Donor*, Dr. W. M. Dobie.

Royal Society of Arts, Directory of, 1909; Edited by H. T. Wood.

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*Smithsonian Institution—

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*Staffordshire (North) Field Club, Annual Report and Transactions, 1908-9.

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*Torquay Natural History Society, Journal of, Vol. I., No. 1, 1909.

*United States Geological Survey—

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*United States National Museum, Report on the progress and condition of, 1908.

*United States National Gallery of Art.

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*Wisconsin Academy, Transactions of, Vol. XV., Part 11, 1907; Vol. XVI., Part 1., 1908.

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Year Book of Scientific and Learned Societies of Great Britain and Ireland, 1909. By purchase.

"Zoologist," 1909-10. By purchase.

ALFRED NEWSTEAD, F.E.S.,
*Curator and Hon. Librarian.*

MAY 19th, 1910.

# Kingsley Memorial Prizes

ARE OFFERED UNDER THE FOLLOWING CONDITIONS:—

## CLASS I.

**TO ANY RESIDENT IN THE SOCIETY'S DISTRICT.—A Prize not exceeding TEN POUNDS for the best Collection of Objects, or Essays, or Notes of Observations, or Photographs illustrating the Natural Science of the Society's District.**

All Collections must be made in Cheshire and North Wales, or the Seas adjoining thereto, by the Competitors.

Collections, or Essays, or Notes, must be sent to the General Secretaries on or before September 1st, and the awards will be made at the Conversazione next succeeding.

The Committee have the option of retaining successful Collections, &c., for the Society.

# Prizes and Certificates for Nature Study.

## SPECIAL PRIZE OF FIVE POUNDS

**Offered to Members only of the Chester Society of Natural Science, Literature, and Art (without restriction as to age), by THOMAS SHEPHEARD, Esq., F.R.M.S., for the Best Collection of Recent and Fossil Foraminifera of the Society's District (Cheshire and North Wales).**

## CLASS II.

## KINGSLEY MEMORIAL and Mrs. GEORGE CHURTON PRIZE FUNDS.

**The following are offered by the above Society to Boys and Girls residing in Cheshire and North Wales:—**

**The First Prize in each Class will be HALF-A-GUINEA, together with the Society's Certificate.**

**Collections, Essays, or Photographs not gaining a Prize may be awarded Certificates if found to be of sufficient merit.**

### FOR SECONDARY AND PRIVATE SCHOOLS.

1. For the best account of the Structure and Functions of Green Leaves, their *structure* being illustrated by sketches, and their *functions* by drawings and descriptions of experiments performed, if possible, by the writer.
2. For the best account of the structure and functions of each part of a complete Flower. Name a Plant which has three kinds; another which has two kinds; and another which has no complete Flowers. What advantage is the peculiarity to the Plant in each case?
3. For the best list of Birds common in your district: (*a*) in Summer; (*b*) in Winter. Name the principal foods and general nesting place of each.
4. For the best Four Photographs of Streams or Rivers.
5. For the best series of Drawings illustrating the Young Shoots of our Native Trees just when the Leaf-bud is opening. (Special Prize offered by Dr. H. DRINKWATER, F.R.S. (Edin.), Wrexham).

### FOR PUBLIC ELEMENTARY SCHOOLS.

1. For the best account of the twelve most Common Weeds in your neighbourhood. Say why each is so abundant, and send a dried named specimen of each.
2. For the best description of how Plants and Animals protect themselves against extremes of Heat, Cold, and Storms; and also against other Plants and Animals.
3. For the best Collection of Land and Fresh-Water Shells. The specimens to be mounted on Cards, and the name and locality given.
4. For the best account of the Life-Histories of the Lesser Celandine (*Ranunculus ficaria*); the Cuckoo Flower (*Cardamine pratensis*); the Coltsfoot (*Tussilago farfara*); and the American Water-Weed (*Anacharis alsinastrum*).

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CONDITIONS.—All the actual work must be done entirely by the Competitors, who must be under 17 years of age. Of course, assistance and instruction from Teachers and Books is permissible and desirable, but mere copied or dictated Essays will be disqualified. The Essays and Collections should be sent under a *nom de plume*, accompanied by a sealed letter containing the full name and exact age of the Competitor, to the under-noted at the Grosvenor Museum, on or before September 1st, 1910, free of any charge.

The Collections, Specimens, &c., will be exhibited in the Grosvenor Museum after the awards have been made, due notice of which will be sent to each Competitor. No Competitor will be allowed to take more than two Prizes or Certificates.

The awards will be made at the Society's Conversazione next succeeding the adjudication.

The Committee do not bind themselves to give the full Prize in case of insufficient merit.

Any further information required can be had on application to the Hon. Secretaries.

# KINGSLEY MEMORIAL MEDAL

ESTABLISHED 1877,

*"For having contributed materially to the promotion and advancement of some branch or department of Natural Science."—Vide* TRUST DEED.

1877—MRS. CHAS. KINGSLEY (In Memoriam).
1878—JOHN PRICE, M.A.
1879—SIR PHILIP DE MALPAS GREY-EGERTON, BART., F.R.S.
1880—PROF. T. MCKENNY HUGHES, F.R.S.
1881—D. MACKINTOSH, F.G.S.
1882—ISAAC BYERLEY, M.R.C.S., F.L.S.
1883—GEORGE W. SHRUBSOLE, F.G.S.
1884—ALFRED OSTEN WALKER, F.L.S.
1885—JOHN DAVIES SIDDALL.
1886—HENRY STOLTERFOTH, M.A , M.D.
1887—WILLIAM SHONE, F.G.S.
1888—THOMAS SHEPHEARD, F.R.M.S.
1889—THOMAS RUDDY.
1890—REV. CHARLES WOLLEY-DOD, M.A.
1891—ROBERT NEWSTEAD, F.E.S.
1892—OSMUND W. JEFFS.
1893—EDMUND J. BAILLIE, F.L.S.
1894—W. MURRAY DOBIE, M.D., F R.A.S.
1896—REV. ARTHUR H. FISH, B.A., B,Sc.
1897—WILLIAM HENRY DOBIE, M.B.
1899—W. F. LOWE, A.R.S.M., F.I.C., F.C.S.
1900—JOSEPH AKKLE.
1901—THOMAS ALFRED COWARD.
1902—CHARLES OLDHAM.
1903—GEORGE P. MILN.
1904—GEORGE O. DAY, F.E.S.
1905—C. THEODORE GREEN, M.R.C.S., L.R.C.P., F.L.S., &c.
1906—FREDERICK WILLIAM LONGBOTTOM, F.R.A.S.
1907—REV. J. CAIRNS MITCHELL, B.D., F.R.A S.
1908—ALFRED WALTER LUCAS, F.G.S.
1909—H. DRINKWATER, M.D., F.R S. (Edin.)

# KINGSLEY MEMORIAL PRIZES

(OF £5 AND UPWARDS)

ESTABLISHED 1877,

*"For the reward, encouragement, and the advancement of the pursuit and study of Natural Science."– Vide* TRUST DEED.

| | | |
|---|---|---|
| 1878 | HELEN SMITH ..... £5<br>EDWIN W. OKELL..... 5 | *Herbarium of Flowering Plants.* |
| 1879—GEORGE SHRUBSOLE..... | 5 | *Carboniferous Fossils.* |
| 1881—E. HOPKINS..... | 5 | *Cryptogamous Plants.* |
| 1882—GEORGE SHRUBSOLE..... | 10 | *Corals of the Mountain Limestone.* |
| 1886—ROBERT NEWSTEAD..... | 10 | *Hymenoptera.* |
| 1887—JOHN LYON DENSON ..... | 5 | *Notes on Observations illustrating the Natural Science of the Society's District.* |
| 1888—LILIAN E. TOMLIN..... | 5 | *Coleoptera.* |
| 1889 | EDITH C. TOMLIN ..... 5<br>W. E. SHARP..... 5 | *Diptera and Hymenoptera (Terebrantia).*<br>*Coleoptera.* |
| 1890—ALFRED J. NIXON ..... | 10 | *Land and Fresh-Water Shells.* |
| 1892—W. E. SHARP ..... | 10 | *Coleoptera.* |
| 1896—ALFRED NEWSTEAD...£5 5s. | | *Hydradephaga (Water Beetles) and Life Histories of Insects.* |
| 1897—ALFRED NEWSTEAD . £5 5s. | | *Life Histories of Insects.* |
| 1900—MISS M. BOWERS..... . | £5 | *Collection of Botanical Specimens.* |
| 1901—A. E. GOODMAN .....£5 5s. | | *Collection of Photo-Micrographs, with Notes and Observations.* |
| 1902 C. THEODORE GREEN ...£10 | | *Collection of 148 Microscopical Preparations and 170 Herbarium Specimens of Micro-Fungi, together with a descriptive Catalogue and Essay on same.* |
| 1906—HUGH H. THOMAS ...£8 8s. | | *Collection of Fossil Plants from the Lower and Middle Beds of the Coal Measures of Denbighshire, together with descriptive notes of same.* |

Amounts less than £5 are also awarded annually.

## LAST YEAR JUNIOR PRIZES AND CERTIFICATES WERE AWARDED AS FOLLOWS:—

**1.—For the best collection of twenty Dry Fruits of Native Plants, named and grouped in such a way as to show their different modes of dispersal, with Notes thereon:—**

**First Prize and Certificate—**
VIDA KENNERLEY, Higher Grade School, Hunter Street, Chester

**Certificate of Merit Highly Commended—**
NELLIE WORTHINGTON, High School for Girls, Macclesfield

**Certificate of Merit—**
DORA A. BAXTER and ETHEL D. M. BAXTER, Christ Church School, Eaton, near Congleton
CECILY M. CARVER, Sale High School for Girls
PHYLLIS MCKIE, Bangor County School for Girls
GWENDOLEN HUMPHREYS, Northwich High School
HERBERT FOULKES, VERNON JONES, ERIC NORBURY, and HAROLD COTTON, Port Sunlight Senior School
EDITH SMITH, Girls' C. E. School, Hoylake
ELSIE M. ASTLEY, AMY THOMAS, CONSTANCE HUGHES, KATHLEEN WEAVER, GRACE HARVEY, EVELINE G. V. DAVIES, ELSIE NORDEN, BERNICE M. CORNES, DORIS THOMASON, and MURIEL JACKSON, Higher Grade School, Hunter St., Chester

**2.—For the best descriptions of six Climbing Plants growing in hedge-rows, with Drawings illustrative of their methods of climbing:—**

**First Prize and Certificate—**
REGINALD EVANS, Grove Park County Schools, Wrexham

**Special Prizes and Certificates—**
DOROTHY WALKER, School of Art, The Grosvenor Museum
HILDA M. BECKETT, Higher Grade School, Hunter Street, and City and County School for Girls, Chester
THOS. L. POWELL and WM. H. SINGLETON, The College School, Chester

**Certificate of Merit—Highly Commended—**
ELLEN S. YATES, Glanavon School, Chester
DOROTHY COOPER, Penrhos College, Colwyn Bay
ETHEL D. DYSON and DOROTHY LANSDALE, Sale High School for Girls
LOUIE WILLIAMSON and FREIDA TWISS, Love Street Higher Grade Council School, Chester

**Certificate of Merit—**
KATHLEEN CURLETT, The Queen's School, Chester
MARY ALLMAN, Girls' School, Alderley Edge
WINIFREDE M. WATSON, EVLYN M. BECK, PHYLLIS M. ANDERSON, and DOROTHY TEARE, Glanavon School, Chester
KATHLEEN WATT, Penrhos College, Colwyn Bay
ELIZABETH WARBURTON, Styal Oak School, Handforth
GEORGE L. ASTLE, Christ Church School, Eaton, near Congleton
FLORA B. HOOLEY, High School for Girls, Macclesfield
JOHN HIGNETT, Ashton Hayes C. E. School
ELEANOR HOLMES, BEATRICE JONES, DOROTHY WATKINS, EDITH LOUGHTON, MILLIE BOX, GRACE MACKENZIE, and OTELIA GORDON, Victoria Road Council School, Chester
EMILY BENSON, NELLIE CLARKE, ANNIE REYNOLDS, ANNIE JARVIS, EVA WARRINGTON, CHAS. CLARKE, WILLIE VENABLES, FRED. PRICE, GEORGE SMITH, and GEORGE VENABLES, Great Saughall School, Chester
KATHARINE M. HODGKINSON, Stockport High School
MARIE GREENWOOD, FREDA MARTINDALE, DOROTHY MORRIS, and LILIAN CHIONALL, Port Sunlight Senior School
ERNEST H. CORNES, The College School, Chester
REGINALD W. FRANCIS and HARRY LEACH, All Saints' Boys' School, Hoole
HEULWEN THOMAS, Dr. Williams' School, Dolgelley
ELSIE PARRY, Nothwich High School for Girls
DOROTHY DUTTON, ELSIE EATON, EDITH PRESTON, MARION DAVIES, and EVELYN EVANS, Love Street Higher Grade Council School, Chester
ESTHER L. LEWIS, DOROTHY DAVIES, and ADA JONES, Higher Grade School, Hunter Street, Chester

**3.—For the best Notes and Observations on the Habits and Life-History of the Titmice** *(Paridæ)*:—

**First Prize and Certificate—**

LIONEL HUMPHRY-WILLIAMS, The King's School, Chester
A. W. CARDEN LOCKWOOD, Wirral House School, Chester

**Special Prizes and Certificates—**

ELLEN S. YEATS, ADA E. HARRISON, DOROTHY TEARE, and BERTHA M. WEST, Glanavon School, Chester

**Certificate of Merit—**

CONSTANCE M. MILN, The Queen's School, Chester
WINIFREDE M. WATSON, FLORENCE D. KILLON, AMY M. HARRISON, EVLYN M. BECK, PHYLLIS M. ANDERSON, and JOSEPHINE E. KILLON, Glanavon School, Chester
MAGGIE WOODS, St. John's R C. School, New Ferry
J. H. ALLWOOD, BERTIE TYLER, and HORACE HASSALL. Aldersey Grammar School, Bunbury

**4.—For the best account of the Life-History of the Common Frog:—**

**First Prize and Certificate—**

ROSALINDE A. M. HUTCHINSON, Penrhos College, Colwyn Bay

**Special Prizes and Certificates—**

ROBERT W. FENN, Wallasey Grammar School, Liscard
HERBERT FOULKES, Port Sunlight Senior School
A. W. CARDEN LOCKWOOD, Wirral House School, Chester

**Certificate of Merit—**

HANNAH JACKSON, ELSIE WINSTANLEY, MARY FOULKES, and ADDIS WILLIAMSON, Victoria Road Council School, Northwich
NANCY DOOTSON, DOROTHY SMITH, JOAN E. DEAKIN, DORIS HEAP, MARIE WARDMAN, JOAN POTTS, EDITH CHATWIN, FLORENCE HILDITCH, DORIS CULLWICK, DOROTHY BANKS, WINIFRED EVANS, DOROTHY EVANS, and HELEN BRIGGS, Penrhos College, Colwyn Bay
EPHRAIM MANLEY, FRANK WINDSOR, JOHN WINDSOR, THOS. W. WILLIAMS, LEONARD BROUGHTON, EDGAR DUTTON, and LESLIE PARKER, Aldersey Grammar School, Bunbury
HILDA NOONAN, ALICE WOODS, KATIE MCKANE, ANNIE JOLLEY, PATRICK MARCHANT, THOS. DUGGAN, PATRICK RICE, JAMES BOWE, GEORGE MARCHANT, LOUIS HEFFERNAN, and WILLIAM GREENWAY, St. John's R. C. School, New Ferry
GLADYS E. EDWARDS, ANNIE HINDE, DORIS MATHEWS, and MARGARET DAVIES, Bunbury Girls' School
DOROTHY HOUGH and DORIS WYNNE, Port Sunlight Senior School
EDWARD S. DUFFIELD, Wirral House School, Chester
ARNOLD TARRANT and WILLIAM LEWIS, The College School, Chester
EVELINE JONES, Love Street Higher Grade Council School, Chester

**5.—For the best Notes of Observations on the River Dee; either above or below the Weir:—**

**First Prize and Certificate—**

J. DOUGLAS MILN, Arnold House School, Chester

**6.—For the four best Photographs of Natural Objects, such as: Birds, Trees, Flowers, Rocks, Clouds; or Scenery of Cheshire or North Wales:—**

**First Prize and Certificate—**

W. WALLACE MILN, Arnold House School, Chester

**Special Prize and Certificate—**

FRANK W. HIGGINS, School of Art, Grosvenor Museum

**Certificate of Merit—**

LINDA T. ROGERS, Dr. Williams' School, Dolgelley
ROBT. WM. WILLIS, Birkenhead Institute

**7.—For the best Working Model of a Sun-Dial :—**

**First Prize and Certificate :—**

ARTHUR MOORE, Victoria Road Council School, Northwich

**Special Prize and Certificate** -

W. A. HAROLD GOODMAN, City and County School for Boys, Chester

**Certificate of Merit—**

STANLEY HENSHAW, All Saints' Boys' School, Hoole, Chester
WILLIAM HEWITT, WILLIAM TRIPP, JOSEPH BROADY, LESLIE RICHARDS, and WILLIAM RILEY, Higher Elementary School, Hale, Altrincham
HILDA SUTTON, Sale High School for Girls
FRANK WEAVER, WILLIAM FORMSTONE, THOS. VAUGHAN, and GEORGE REEVES, Boughton Council School, Chester
EVELINE JONES, Love Street Higher Grade Council School, Chester
GORDON E. MARTIN, and THOS. C. RIDLEY, The College School, Chester

**8—For the best Drawings of the Shape of the Moon, made on every day of the month (as often as clouds will allow) accompanied by Notes, stating time of rising, time when the Drawing was made, region of sky in which the Moon was seen, and any conclusions which may be drawn from these observations :—**

**First Prize and Certificate—**

OLIVER JAMES, Port Sunlight Senior School

**Certificate of Merit—**

LILLIE ASHTON, Sale High School for Girls

**Awards were also made to the following Junior Members, for having contributed specimens of Native Plants to the Exhibition held at the Grosvenor Museum during the summer months :—**

The MISSES ANNIS A. TATLER and HILDA WILLIAMS, and MASTER DAVID MILN.

# LIBRARY RULES.

1.—The Library will be open daily, except on Holidays, from 10 a.m. to 4 p.m. ; and from 6 p.m. to 9-30 p.m. on the evenings when the Societies meet.

2.—As the Library is intended for purposes of study and reference, Members are expected to abstain from conversation which may be disturbing to other readers.

3.—Members are requested not to replace Books on the shelves, but to give them to the attendant for replacement.

4.—No Periodicals belonging to either Society are to be taken out of the Library.

5.—The Books belonging to the Archæological Society are intended as books of reference, and must not be taken away.

6.—Books belonging to the Society of Natural Science may, with certain exceptions, be taken out by Members of the Society, under the Rules of the Society. A receipt must be given to the Librarian for all Books so borrowed.

7.—Persons who are not Members of either Society, desiring to use the Library, must present a letter of introduction from a Member, endorsed by the Secretary, or President, of the particular Society whose Books they wish to consult ; such order to be available for one week only.

# PAST PRESIDENTS.

1871 to 1875—Rev. Charles Kingsley, Canon of Chester
*(Founder of the Society)*
1875 „ 1891—Prof. T. McKenny Hughes, F.R.S.
1891-2 Alfred O. Walker, Esq., J.P., F.L.S.
1892-3 His Grace The Duke of Westminster, K.G.
1893 to 1895—W. Murray Dobie, Esq. M.D., J.P., F.R.A.S.
1895 „ 1897—Henry Stolterfoth, Esq., M.A., M.D., J.P.
1897-8 Thomas Shepheard, Esq., F.R.M.S.
1898 to 1902—John D. Siddall, Esq.
1902 „ 1906—Rev. Arthur H. Fish, B.A., B.Sc.
1906-7 Fredk. Wm. Longbottom, Esq., F.R.A.S.
1907 to 1909—Alexander Hamilton, Esq, F.R.C.S., &c., J.P.

## SOCIETIES ASSOCIATED,

WITH WHICH THE SOCIETY EXCHANGES PUBLICATIONS.

Academia Nacional de Ciencias de la Republica Argentina, Cordoba
Ashmolean Natural History Society, Oxfordshire
Barrow Naturalists' Field Club
Bournemouth Natural Science Society
Brighton and Sussex Natural History Society
Bristol Naturalists' Society
British Association (Corresponding Societies' Committee).
British Museum (Natural History), Cromwell Road, London, S.W.
Brooklyn Institute of Arts and Sciences, Brooklyn, N.Y.
Burnley Literary and Scientific Club
Cardiff Naturalists' Society
Colorado, University of, Boulder, Colorado, U.S.A.
Corporation Museum, Colchester
Dudley and Midland Geological and Scientific Society and Field Club
Ealing Scientific Society, Ealing, London
Essex Field Club
Glasgow Natural History Society
Hertfordshire Natural History Society and Field Club
Huddersfield Naturalists' Society
Illinois Library, University of, Urbana, Illinois, U.S.A.
Kensington (South), London Circulation Collections, Victoria and Albert Museum
La Société d'Histoire Naturelle de St. Wladimir á Kiew, Russie
Lancashire and Cheshire Entomological Society
Llandudno Naturalists' Field Club
Leeds Naturalists' Club.
Liverpool Botanical Society
Liverpool Geological Society
Liverpool Geologists' Association
Liverpool Literary and Philosophical Society
Liverpool Microscopical Society
Liverpool Naturalists' Field Club
Liverpool Science Students' Association
Liverpool Astronomical Society
Lloyd Library and Museum, Cincinatti, Ohio, U.S.A.
London Geologists' Association
Manchester Entomological Society
Manchester Field Naturalists and Archæologists' Society
Manchester Geological and Mining Society
Manchester Microscopical Society
Mexico, Geological Institute of
Missouri Botanical Garden, St. Louis, U.S.A.
Montana, University of, Biological Station, Missoula, Montana, U.S.A.
Northampton Natural History Society
North Staffordshire Naturalists' Field Club and Archæological Society
Nottingham Naturalists' Society
Patent Office Library, 25, Southampton Buildings, Chancery Lane, London, W.C.
Scotland, West of, Marine Biological Association
Smithsonian Institution, Washington City, D.C., U.S.A.
Southport Society of Natural Science
Torquay Natural History Society
United States Geological Survey
Washington, University of, Seattle. Wn., U.S.A
Wisconsin Academy of Sciences, Arts, and Letters, Madison, Wis., U.S.A.
Vatican Observatory, Rome
Vienna Natural History Museum
Yorkshire Naturalists' Union, Leeds.

## HONORARY MEMBERS.

*Those marked (*) have read or contributed Papers at the Society's Meetings.*

*Avebury, The Right Hon. Lord, F.R.S. ... *Down, Farnborough, Kent*
*Ball, Sir Robert S., F.R.S. ... ... *Observatory, Cambridge*
Candolle, Mons. Casimir De ... *Geneva*
*Carruthers, W., Esq., F.R.S. ... *14, Vermont Road, Norwood, London, S.E.*
*Clowes, Prof. Frank, D.Sc., F.C.S. ... *The Grange, College Road, Dulwich, S.E.*
Credner, Dr. Hermann ... ... *Leipzic*
*Dawkins, Prof. W. Boyd, F.R.S. ... *Woodhurst, Wilmslow Road, Fallowfield, Manchester*
Dobbie, James J., Esq., D.Sc., F.R.S. ... *Government Laboratory, Somerset House, London*
Hooker, Sir J. D., K.C.S.I., F.R.S. ... *The Camp, Sunningdale, Ascot*
*Hughes, Prof. T. McKenny F.R.S. ... *Trinity College, Cambridge*
*Hull, Prof., F.R.S. ... ... *14, Stanley Gardens, Notting Hill, London, W.*
*Judd, Prof. J. W, F.R.S., C.B. ... *30, Cumberland Road, Kew, London*
Kent, W. Saville, Esq., F.L.S., F.Z.S., F.R.M.S. ... *Belsito, Melford-on-Sea, Hants*
*Newstead, Prof. Robert, M.Sc., A.L.S., F.E.S. ... *Witcombe Villa, Handbridge, Chester*
*Plummer, W. E., Esq., M.A, F.R.A.S. ... *The Observatory, Bidston, Birkenhead*
*Poulton, Prof. E. B., F.R.S. ... *Wykeham House, Oxford*
*Rae, E., Esq., F.S.A. ... ... *Courthill, Birkenhead*
Röntgen, Prof. W. K. ... ... *Würzburg*
Roscoe, Sir Henry E., F.R.S. ... *10, Bramham Gardens, London, S.W.*
*Rudler, F. W., Esq., F.G.S., I.S.O. ... *18, St. George's Road, Kilburn, London, N.W.*
*Strahan, Aubrey, Dr, F.R.S. ... ... *23, Jermyn Street, London, S.W.*
Thomas, W. Beach, Esq. ... *The Old Cottage, Kimpton, Welwyn, Herts.*
*Vize, Rev. J. E., M.A. ... *1, Woodstock Avenue, Redland, Bristol*
Wallace, Dr. A. Russel, F.R.S. ... *Broadstone, Wimborne, Dorset*

## CORRESPONDING MEMBERS.

Brodrick, The Hon. Mrs. Lawrence ... *Coed Coch, Abergele*
Cooke, Col. B. G. Davies ... *Colomendy, Mold*
Coward, Mr. T. A., F.Z.S. ... *Brentwood, Bowdon*
Day, Mr. George, F.E.S. ... *"Sahlatston" Duncans, Vancouver Island, British Columbia*
*Dallman, Mr. Arthur A., F.C.S. ... *111, Penny Lane, Wavertree, Liverpool*
*Dunlop, Mr. G. A. ... *The Museum, Warrington*
Dutton Mr. F. V., B.Sc., ... ... *County Council Offices, Exeter*
*Feilding, Mr. J. Basil, F.L.S., F.Z.S., J.P. *River Bank, Holywell*
Griffith, Mr. J. E., F.L.S., F.R.A.S. ... *Bryn Dinas, Upper Bangor, N.W.*
Gillanders, Mr. A. T. ... *The Parks, Alnwick*
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Jones, Mr. R. J. Gresley ... *School House, Bodafon, Llandudno*
*Jones, Mr. J. Philip ... *Pendre, Holywell*
Nicholson, Mr. A. C., F.G.S. ... *14, Ferndale Road, Hoylake, Birkenhead*
Nixon, Mr. A. J. ... *Birdham School, Chichester*
*Oldham, Mr. C. ... *Essex House, Watford, Herts*
Perkins, Miss Steele ... ... *Bryngwylad, Grange Road, Rhyl*
*Reade, Mr. Oswald A. ... *Haslar Naval Hospital, Portsmouth*
Roberts, Mr. J. W. ... *High Street, Bala*
Rooper, Mr. F. E., F.G.S. ... *Bronydd, Glyn, Ruabon*
*Ruddy, Mr. Thomas ... *The Woodlands, Llangollen*
Russell, Dr. ... *Colwyn Bay*
Sopp, Mr. E. J. B., F.R.Met.S., F.E.S. ... *104, Liverpool Road, Birkdale*
Thompson, Mr. A. H. ... *12, Salisbury Road, Bexley, Kent*
Tomlin, Mr. J. R. le B., M.A., F.E.S. ... *Stonely, Alexandra Road, Reading*
*Wilkins, Mr. T. S. ... *Uttoxeter*
Williams, Mr. G. J., F.G.S. ... *H.M. Inspector of Mines, Bangor*
*Williams, Prof. J. Lloyd, D.Sc ... ... *University College of North Wales, Bangor*

# NOTICE.

☞ **THE ANNUAL SUBSCRIPTIONS are due on the 1st of May in each year. Members who have not paid for the present year are respectfully requested to forward the amount (Five Shillings) to the Hon Treasurer, Mr. JOHN SIMON, Chemist, 4, Eastgate Row.**

*** *To prevent a recurrence of a frequent misunderstanding, Members are reminded that their names are retained on the Society's Books, and their subscriptions considered due, until notice has been given to the contrary, according to Rule* 9.

# LIST OF MEMBERS.

*Those marked (*) have read or contributed Papers at the Society's Meetings.*

Acton, Mr. T. Arthur ..... Wrexham
Acton, Mrs. ..... 3 Grove Road, Wrexham
Adair, Major-General ..... 7 Stanley place
Adams, Mr. Beresford ..... Shirley House, Liverpool road
Adams, Mrs. ..... ,, ,,
Adams, Mr. H. Dean ..... ,, ,,
Adams, Mr. Geo. F. ..... Ashbourne, Victoria road
Adams, Miss Sissy ..... ,, ,,
Ainsworth, Miss F. ..... 4 Nicholas street
Aldersey, Miss Rose F. ..... Bryn Field, 10 Brook lane
Aldis, Mr. Osborne, M.A. ..... 14 Victoria pathway, Queen's park
Allen, Miss ..... Waverton
Almond, Mr. T. D. ..... Boughton P.O., Tarvin road
Alvey, Mr. Edward ..... Ashton Hayes School
Anderson, Mr. J. Leggett ..... 19 Brook lane
Anderson, Miss ..... Ranmoor, Tarvin bridge
Andrew, Mr. John R. ..... 18 Bold square
Andrew, Miss R. ..... ,,
Andrews, Miss Edith ..... 2 West view, Dee banks
Andrews, Miss Margaret ..... ,, ,,
*Arkle, Mr. J. ..... 2 George street
Arkle, Mr. Henry ..... ,,
Armstrong, Mr. Andrew W. .... Spring Villa, 22 Liverpool road
Armstrong, Mrs. ..... ,, ,,
Armstrong, Mrs. Frances ..... 62 Gladstone road
Armstrong, Miss ..... 26 Bouverie street
Ascroft, Mr. F. W. ..... 47 Nicholas street
Ascroft, Mrs. ..... ,,
Ashworth, Mr. Alfred, J.P. .... Horsley Hall, Gresford, Wrexham
Atcherley, Mrs ..... 6 Stanley Place
Ayrton, Mr. A. ..... 2 Chichester street
Ayrton, Mrs. ..... ,, ,,
Aryton, Mr. Wm. ..... The Cliff, Beccles, Suffolk

Bailey, Mr. H. Grant .....98 Foregate street
Baillie, Mr. Edmund .....35 Hamilton street, Hoole
*Bairstow, Mr. J., F.C.S.....Burley, Queen's park
Bairstow, Mrs. ..... " "
Bairstow, Mr. Herbert .....33 Percy road
Baker, Miss .....2 Grey friars
Ballance, Mr. W. .....5 Vicarage road, Hoole
*Ballard, Mr. E. G., A.R.S.M....6 Grey friars
Ballard, Mrs. ..... "
Bannister, Miss E. A. M. .....63 Foregate street
Barber, Ven. Archdeacon, M.A., F.S.A. ..... } St. Bridget's Rectory
Barbour, Mr. Geo., D.L., J.P. ..Bolesworth Castle, Tattenhall
Barbour, Mrs. ..... " "
Barnes, Mr. N. F. .....Eaton Gardens
Barnes, Mr. J. W. .....Grosvenor Park House, Union street
Barnes, Mrs. ..... " "
Barnett, Mr. S. .....7 Victoria pathway, Queen's park
Barnett, Mrs. ..... " "
Bassett, Miss C. E. .....68 Northgate street
Bate, Mrs. J. C..... .....Summerfield, Kilmorey park
Bates, Mr. W. N.....Talbot Hotel, Newgate street
Bates, Mrs. ..... " "
Bate, Mr. George .....White House, Bersham, Wrexham
Beauchamp, Rt. Hon. The Earl K.C.M.G..... } Madresfield Court, Malvern
Beauchamp, Rt. Hon. The Countess " "
Beckett, Mr. F. J., A.C.A.....Watergate Flags
Beckett, Mrs..... ..... "
*Bedford, Rev. J. L., M.A., F.L.S. 10 Abbey square
Bedford, Mrs. ..... "
*Belton, Mr. J. C. .... ..... ....Craigside, Sandy lane
Bennett, Mrs. J. Nevitt .....Addiscombe, Hough green
Beswick, Miss Jessie.....3 Sunny bank, Queen's park
*Beveridge, Rev. P. J., M.A., B.Sc. (Hons). ..... } Olive Mount, Tranmere, Birkenhead
Beveridge, Mrs. ..... "
Birch, Mr. H. J. .....Corville, Liverpool road"
Birch, Miss..... .....18 Upper Northgate street
Bithell, Mr. W.....Messrs. Beckett & Co., Eastgate row
Blagden, Mr. John J., M.R.C.S., L.R.C.P., 5 King's buildings
Blagden, Mrs. .....
Blayney, Mr. A. .....3 City Walls (W.)"
Bleckly, Mr. Herbert S. .....Tentry Heys, Queen's park
Bleckly, Mrs... ..... " "
*Blogg, Rev. Canon, M.A. .....Frodsham Vicarage, Cheshire
Blomfield, Admiral Sir R. M., K.C.M.G. } c/o Messrs. Woodhead & Co., 44 Charing Cross, London
Blower, Mr. T. B.....6 The Groves
Boden, Mr. Robt. W.....19 Corn Exchange Chambers
Bolland, Mrs.....46 Hough green
Bolland, Mr. Frank ..... "
*Bonnalie, Mr. Fredk. J., J.P., L.D.S., R.C.S., 7 Abbey square
Bonnalie, Mrs. .....Brookfield, Brook lane
Booley, Miss .....11 Lorne street
Boscawen, Mrs.....Trevallyn Hall, Rossett
Bowers, Mr. J. H. .....Tyddyn Ucha, Pen-y-bryn, Ruabon
Bowles, Mrs. T. S. .....The Hollies, Liverpool road
Bowles, Miss Agnes Millicent .. " "
Bowley, Miss Gladys .....Newgate Street House
Box, Miss Jessie .....4 Kilmorey road

Boyer, Miss Edith .....Witton House, Roodeye
Boyle, Rev. D. H., M.A., B.Sc ..The College
*Boyce, Sir Rubert, F.R.S.....The University, Liverpool
Brassey, Miss .....Rose Hill, Bowdon, Cheshire
Brassey, Mr. Herbert .....The Limes, Curzon park
Brassey, Mrs... ..... ,, ,,
Bridge, Prof. J. C., M.A., D.Mus., F.S.A...Christ Church Vicarage
Bridge, Mrs. ..... ,, ,,
Britton, Mr. Sydney E. .....Evercreech, Glanaber park
Britton, Mrs. ..... ,, ,,
*Broadbent, Mrs. .....Bache Cottage
Broom, Mrs. .....2 Nicholas street
Brown, Mr. H. F., LL.B. .....18 Curzon park
*Brown, Mrs., M.A. ..... ,,
Brown, Miss .....61 Bouverie street
Brown, Miss Daisy ..... ,,
Brown, Mr. W. E. .....33 Parkgate road
Brown, Mrs. ..... ,,
*Brown. Mr. W. Ernest ..... ,,
Brown, Mr. E. C. .....7 West Lorne street
Brown, Mr. Fred.....2 Eastgate row
Browne, Mr. Morton .....Lacheholme, Lache lane
Browne, Mr. J. L., M.B., Ch. B...Dee Hills park
Browne, Mrs. ..... ,,
Buckland, Miss .....31 Nicholas street
Bull, Mr. H. F. .....4 Sunny Bank, Queen's park
Bullin, Mrs. .....20 Nicholas street
Bullin, Miss E. ..... ,,
Burges, Miss J. V. .....Whitford, 11 Panton road, Hoole
Burges, Miss L. O. ..... ,, ,,
Burness, Mr. Wm. .....Parr's Bank, Ltd., Chester
Butcher, Mr. Jas. .....7 Stocks lane
Byrne, Mr. G. W. .....5 Abbey square

Caldecott, Miss C. G. ..... Metropolitan Children's Home, Broadstairs, London
Cameron, Mrs. .....Romano, Grove road, Wrexham
Campbell, Mrs. Pitcairn .....Christleton Hall
Campbell, Mr. A. D. Pitcairn....Bangor-on-Dee, Wrexham
Carmichael, Mr. F. M. ..... Westminster Hotel
Carter, Mr. T. .....171 Boughton
Caruth, Miss Annie .....35 Clare avenue, Hoole
Catherall, Mr. Samuel .....1 Linenhall street
Chalton, Mr. T. W. ..... Wynstay, Hoole
Chalton, Mrs. ..... ,,
*Chester, The Right Rev. The Lord Bishop of ..... } The Palace, Dee Side
Chidley, Mr. T. .....14 St. Werburgh street
Clark, Miss Sybil ..... Stanley House
Clark, Miss Eva .....19 Grosvenor street
Clarke, Mr. John ..... Pasadena, Liverpool road
Clarke, Mrs. ..... ,, ,,
*Clarke, Mr. W. J. .....22 Corn Exchange Chambers
Clarke, Mr. Ernest (B. Eng.) ..... ,, ,,
Clare, Mr. Horatio .....Grosvenor (St. John's) Schools
*Clay, Miss Beatrice E., B.A. ....The Queen's School
Clemence, Mr. Thos. .....56 Hough green
Clough, Mr. G. F. Butler .....78 Hough green
Coates, Miss .....19 Raymond street
Cochrane, Mr. J. G. .....9 Grange road, Brook lane
Cockrill, Mr. C. P. .....Briercliffe, Hough green
Cockrill, Mrs..... ,, ,,

Coe, Mr. D. .....Howard Lodge, Hamilton street
Coe, Mr. Henry J. .....18 Queen's avenue
Coltart, Mr. C. B. .....“Marna,” Lache lane
Comber, Miss Mary Eleanor ....Woodville, Liverpool road
Comber, Miss Maria E. ..... ,, ,,
Comber, Miss Margaret ..... ,, ,,
Connah, Mr. Jas. .....12 Cecilia road, Heath drive, Hampstead, London, N.W.
Conway, Mr. Walter, C.A. .....5 Sunny bank, Queen's park
Conway, Mrs. ..... ,, ,,
Cook, Miss Maud .....7 The Groves
Cook, Miss Alice M. ..... ,,
Cook, Miss Kate ..... ,,
Cook, Mr. Kenneth, C.A. .....Godstall Chambers
Cooke, Mr. J. H. .....6 Queen street
Cooper, Mr. John .....50 Liverpool road
Coppack, Miss .....Gladwyn, Liverpool road
Coppack, Miss Nellie ..... ,, ,,
Crane, Mr. H. E., A.C.A. .....Savings' Bank House, Grosvenor street
Crofton, Mrs. H. .....5 Eversley park
Crooks, Mr. J. Kirke .....Morwenstowe, Queen's park
Croston, Miss .....
Cullimore, Mr. William ..... Christleton, Chester
Cumberbirch, Miss .....Hilbre, Garden lane
Cumming, Mr. Jas., L.D.S., F.P.S. (Glasgow) .....} 39 City road
*Cummings, Mr. Sidney G. .....Heath Cottage, Upton, Chester
Currie, Dr. J. R., M.D. (Glas.), M.A. (Oxon.) } 74 Hough Green
Currie, Mrs. ..... ,,

*Darby, The Very Rev. J.L., D.D. ..The Deanery
Darby, Mrs. ..... ,,
Darby, Miss ..... ,,
Darby, Mr. Alfred, J.P. .....Laurel grove, near Wrexham
Davies, Miss Henrietta .....69 Boughton
Davies, Mr. E. Henry .....19 Francis street
*Davies, Mr. Joseph .... ,,
Davies, Mr. John ..... .....Parr's Bank, Limited, Chester
Davies, Rev. J. T., M.A. .....6 Abbey green
Davies, Mr. Arthur .....23 Lord street, Boughton
Davies, Mr. E. Harold.....Burland, Westminster park
Davies, Mrs. ..... ,, ,,
Davies, Mr. Horace, A.R.I.B.A., F.S.I. ..14 Newgate street
Davison, Mr. George .....4 Curzon park
Day, Mr. John .....Bryntirion, Chichester street
Day, Mrs. ..... ,, ,,
Day, Miss ..... ,, ,,
Dean, Miss Eileen.....Grosvenor Lodge, Wrexham
Delany, Mrs. .....7 Lorne street (south)
Deeley, Mr C. H., J.P. .....Dalmeny, Saltney
Deeley, Mrs. ..... ,,
Denson, Miss Adelaide .....21 Upper Northgate street
Denson, Mr. J. Lyon ..... 4 Upper Northgate street
Denson, Mrs. ..... ,, ,,
Denson, Mr. W. H., J.P .....Montalt, Westminster road, Hough green
Denson, Mr. F. R. .....Abbot's Mount, 33, Liverpool road
Denson, Miss E. M. ..... ,, ,,
Dickinson, Mr. D. .....1 Upton view, Hoole
Dickinson, Mrs. ..... ,, ,,
Dickson, Mr. J. H. .....Vindauga, Cavendish road, Hough green
Dickson, Mrs. ..... ,, ,,

Dickson, Miss .....Grey Friars House
Digby, Miss .....2 Grey friars
*Dobie, Dr. W. M., F.R.A.S.....4 Hunter street
*Dobie, Dr. W. H., M.B.....2 Hunter street
Dobie, Mrs. ..... ,,
*Dobie, Dr. Herbert .....Northdene, Upper Northgate street
Dobie, Mrs. ..... ,, ,,
Dobie, Mr. Douglas .....Upton House, Chester
Dobie, Mrs. ..... ,, ,,
Dodd, Mr. W. .....Derwent House, Vicarage road, Hoole
Dodd, Mr. Henry .....Lime grove, Panton road, Hoole
Dodd, Mr. John .....73 Bouverie street
Dodd, Mr. James .....Thorndene, Vicar's Cross
Dodds, Mr. Arthur W., L.D.S.E...16 Nicholas street
Donald, Mrs. .....The Cross
Douglas, Mrs. C. P. .....St. Martin's House
Dowdall, Colonel A. P. .....25 Curzon park
Dowdall, Miss A. .... ..... ,,
*Drinkwater, Dr. H., M.D., F.R.S. (Edin.)..Grosvenor Lodge, Wrexham
Drinkwater, Mrs, M.B., B.Sc. (Lond.) ,, ,,
Druce, Mr. C. L. ..... The College, Chester
*Duckworth, Mr. Henry, F.L.S., F.G.S...7, Grey friars
Duckworth, Miss Evangeline M.E. ,,
*Duff, Dr. J. .....5 Abbey street
Dutton, Mr. George F. .....Aldersey Grammar School, Bunbury, Tarporley
Dutton, Mr. H. B. .....Freshfield, 27 Curzon park
Dutton, Mrs. ..... ,, ,,
Dutton, Mr. Stanley G. ..... ,, ,,
Dutton, Miss M. .....11 Grosvenor street
Dutton, Mr. A. E. . .....51 Frodsham street

Earle, Mr. C. A. .....Heywood Lodge, Chester
Eaton, Mr. Wilfrid Herbert ....Parr's Bank, Limited
Edwards, Mr. J. E, L.D.S. ....Regent street, Wrexham
Edwards, Mr. C. P. ..... Officer-in-charge, Marconi Telegraphs, Sable Islands, Halifax, N.S.
Eggers, Miss ..... .... 42 Hough green
Ellington, Mr. N. B. .....44 Bridge street row
*Elliott, Dr. John, B.S., B.Sc....24 Nicholas street
Elliott, Mrs. ..... ,,
Elliott, Miss .....The Hawthorns, 29 Hough green
Ellis, Mr. R. Clarence .....Springwood, Rhosddu, Wrexham
Ellis, Mr. R. J. .....60 Foregate street
Evans-Lloyd, Col., J.P. .....Stanley House
Evans, Mr. Geo. H. ..... .....The Limes, Lumley road
Evans, Miss E. M. .....54 Watergate street
Evans, Mr. A. H. .....St. George's Crescent, Queen's park
Evans, Mrs. ..... ,,
Evans, Mr. W. Wynn .....Thorneycroft, Queen's park
Evans, Mrs. Wynn ..... ,, ,,
Evans, Miss Violet ..... 76 Hough green
Ewing, Mr. C. A. ..... ...Rockcliffe, Queen's park
Ewing, Miss Alice Mabel ..... ,, ,,
Ewing, Miss .....Cartref, Glan Aber park

Farmer, Mr. Richard .....56 Liverpool road
Farquhar, Mr. J. .....61 Parkgate road
Farrall, Mrs. L. M. .....12 Stanley place
Farrimond, Mr. F. T. .....Sunnyside, Boughton

Fennah, Mr. G. H. .....Park House, Grosvenor park road
Fennah, Mrs..... ,, ,,
Ferguson, Mr. W., J.P. .....The Cairn, Liverpool road
Ferguson, Miss J. M. ..... ,, ,,
Ffoulkes, Mr. Geo. B. .....28 Lorne street
Ffoulkes, Miss Jocelyn .....Kingsley Lodge, Liverpool road
Ffoulkes, Miss H. Jocelyn ..... ,, ,,
Finchett-Maddock, Mrs. H. ....Cae Gwyn, Carnarvon
*Fish, Rev. A. H., B.A., B.Sc. ..19 Percival road, Clifton, Bristol
Fish, Mrs. ..... ,, ,,
FitzGerald, Dr. W. A. .....Clare Lodge
Fleming, Mr. T. R. .....Rowton Grange
Fleming, Mrs. ..... ,,
Fleming, Mrs. E. L. .....49 Dee Banks
Fletcher, Miss ..... .....Gleneden, Curzon park
Fletcher, Miss E. B. ..... ,, ,,
Fluitt, Miss ..... .....5 Abbey green
Forster, Mr. W. Angus .....Belgrave Lodge, Pulford, Chester
Footman, Miss .....City and County School for Girls
Francis, Mr. H. K. .....63 Bridge street row
Frater, Mr. Geo. .....4 Leaside, Rhosddu, Wrexham
Frater, Mrs. ..... ,, ,,
Freeman, Mr. C. E. .....Branksome, Brook lane
Freeman, Mrs. ..... ,, ,,
Frisby, Miss .....16 Chichester street
Frost, Mr. J. G., J.P. .....Boughton Hall
Frost, Mrs..... ,,
Frost, Mr. J. M., J.P. .....Upton Lawn
Frost, Mr. T. Gibbons, C.C. ....Mollington Hall
Frost, Mrs..... ,,
Fryer, Rev. J. W. .....24 Bouverie street

Gardner, Mr. E. .....Saighton House, Chester
Garnett, Mrs..... .....The Rectory, Christleton, Chester
Garnett, Mr. J. W. .....45 Bridge street row
Garnett, Mrs..... ,,
Garnett, Mr. J. G., M.A. .....Arnold House, Chester
Garnett, Mrs. ..... ,, ,,
Garside, Mr. Franklin .....Lingards, Prestatyn
Gaulton, Miss Lucy .....6 The Groves
Gibson, Major .....Buckley, *via* Chester
Gibson, Mr. R. M. .....Greenbank, Buckley
Gibson, Miss ..... .....Witton House, Roodeye
Giffen, Mr. J. T. M., F.R.C.S...Richmond Hill, Boughton
Gilbert, Mr. Egerton .....21 Eaton road
Gilbert, Mrs. ..... ,,
Giles, Mr. E. S. .....Gowymede, Vicar's Cross
Giles, Mrs. ..... ,, ,,
Gleadowe, Mr. H. T. S. .....11, Stanley place
Golder, Mr. Jas. T. .....The Birches, Westminster avenue
*Goodman, Mr. A. E. .....Laburnum Grange, Boughton, Chester
Goodman, Mrs. ..... ,, ,,
Goodhart, Mrs. E. S. .....100 Watergate flags
Gore, The Ven. Archdeacon, D.D. . Bowdon, Cheshire
*Graham, Mr. J. Menteith .....36 King street
Graham, Mrs. ..... ,,
Graham, Mr. Victor P. ..... ,,
*Granger, Mr. F. M., M.R.C.S., L.R.C.P.., 18 Nicholas street
Grantham, Rev. H. .....S. Mary's Rectory
Grantham, Miss Gwynydd ..... ,,
Gray, Miss ..... .....6 Lorne street

Greatbanks, Mr. J. .....Kilmorey, Hoole road
Greenhouse, Mr. Chas.....1 Eversley park
*Green, Mr. C. Theodore, M.R.C.S., L.R.C.P., F.L.S., M.B.M.S. } 31 Shrewsbury road, Birkenhead
Green, Mr. J. W. .....The Grosvenor Museum
Greig, Mrs. ..... Anfield, Dee banks, West
Griffin, Rev. C. A. .....The Vicarage, Dunham-o'-the-Hill
Griffin, Mrs. ..... ,, ,,
Griffith, Mr. G. R., J.P. ..... Grosvenor street
Griffith, Mr. G. B .....13 St. Martin's fields
Griffiths, Mr. John.....77 Parkgate road
*Griffiths, Rev. T. T., M.A., R.N., H.M.S. "Isis" } Stirton, Victoria road, N., Southsea, Hants.
Griffiths, Mrs. Robert .....2 Exton park
Griffiths, Miss Bessie ..... ,,
Griffiths, Mr. W. A.....3 Exton park
Griffiths, Mrs,..... ,,
Griffiths, Mr. John .....Ball's Hall, Rossett
Griffiths, Miss..... ,,
Griffiths, Miss M. J. ..... ,,
Griffiths, Mr. T. H. .....57 Ermine road, Hoole
Grills, Dr. .....The Asylum, Chester
Grills, Mrs... ,,
Grindley, Mr. J.....3 Eastgate street
Grindley, Mr. W. J. ..... 25 Cecil terrace, Boughton

Haigh, Mrs. James Alfred ..... 3 The Groves
Hales, Miss.....Cop House, Sealand road
Hall, Mr. James .....24 Saughall road
Hallmark, Mr. W. H. .....21 Milton street
Halsall, Miss .....4 Heath terrace, Boughton heath
*Hamilton, Mr. A., F.R.C.S., J.P. Bodafon, Deganwy, N. Wales
Hamilton, Mrs. ..... ,, ,,
Hamilton, Mr. A. G., M.B.....23 Hoole road
Hankinson, Miss .....61 West street, Hoole
Hannon, Miss.....92 Foregate street
Harker, Miss .....10 Hough green
Harley, Mr. T. D.....41 Cheyney road
Harris, Mr. T. .....Claremont, Dee banks
Harris, Mrs. ..... ,,
Harris, Rev. H.....16 Hough green
Harris, Mrs. ..... ,,
Harris, Mrs. S. H. .....Dyreham, Wrexham road
Harris, Mr. J. Mortimer .....28 Liverpool road
Harris, Mrs. ..... ,,
Harrison, Miss .....38 Eastgate row
Harvey, Miss .....Fern Lea, Holme st., Tarvin, nr. Chester
Harwood, Miss .....Mayfield, Upton Park
Harwood, Miss G. ..... ,,
Haswell, Mr. G. H. .....Highfield, Queen's park
Haswell, Mrs..... ,,
Haswell, Mr. W. H.....94 Foregate street
Haswell, Mr. Geo. W.....28 Bouverie street
*Hatch, Mr. Herbert A., M.Sc. ..The Grosvenor Museum
Hatton, Mr. William .....Figdale, 25 Lorne street (North)
Hatton, Mrs. ..... ,, ,,
*Hawkins, Mr. J. M. .....Fernleigh, Glan Aber park
Heeley, Miss .....24 Moss bank, Parkgate road
Henderson, Mr. J. E. .....19 Pathway, Queen's park

Henderson, Mrs. .....9 Union walk
Heppel, Miss .....39 Lord street
Heron, Mr. E. S. ....."Rostrevor," Banks Avenue, Meols, Hoylake
*Hetherington, Mr. T. .....Engineers' Department, The Post-Office, Glasgow
Hewitt, Mr. D. L.....2 Hough green
Hewitt, Mrs. ..... ,,
Heywood, Mr. H. A. .....Christleton lodge
Higgins, Mr. F. W. .....14 Egerton street
Higgins, Miss E. J. .....6 Mount Pleasant, Saltney
Higginson, Mr. T. .....Engelberg, Percy road
Hignett, Mr. H. Napier .....Shandon, Hough green
Hobbs, Mr. C. J. .....2 Eversley park
Hobbs, Mrs. ..... ,,
Hobday, Mr. Jas. .....Alexandra villa, Liverpool road
Hobday, Mr. Wm. Edward.....22 The Groves
*Hodge, Mr. J. Philp .....7 Hoole park, Chester
*Hodges, Mr. W. .....62 Hough green
Hodgkinson, Miss Mabel.....30 Chichester street
Hogarth, Mr. T. O., M.I.Mech.E...The Lodge, Saltney
Holland, Miss.....17 Chichester street
Holmes, Mrs. L. B. .....Ashcroft, Hough green
Holmes, Miss Ruth ..... ,,
Holme, Mr. Samuel H. .....Downswood, Liverpool road
Holt, Mr. T. J. W., B.Sc. .....c/o Messrs. The Dee Oil Co., Ltd., Saltney
Home, Miss.....Rawcliffe, Selkirk road, Hough green
Hope, Mr. H. G., M.A. .....Sealand view, Canal street
Hopley, Mr. J. H.....6 Northgate street
*Hopley, Mrs. ..... ,,
Hopton, Mr. W. A.....24 Moss Bank, Parkgate road
Hopton, Mrs..... ,, ,,
Hopwood, Miss .....The Deanery
Hornby, Mr. Alex. .....Shipgate House
Hornby, Mrs. ..... ,,
Horner, Mr. W.....42 Grey Rock street, Liverpool
*Howard, Mr. F. T., M.A., F.G.S., West Mount, Waverton
Howard, Mrs..... ,,
Howson, Miss.....The Rectory, Guiseley, Yorks.
Howitt, Mr. J. H., M.A., LL.B., M.R.C.S., L.R.C.P. } Lyme Regis, Hough green
Hughes, Mrs. McKenny .....Ravensworth, Brooklands avenue, Cambridge
Hughes, Mr. John.....47 Victoria street, Westminster, London
*Hughes, Mr. T. Cann, M.A., F.S.A...78 Church street, Lancaster
Hughson, Mr. Arthur .....2 Eastgate row, North
Hughes, Miss Winifred .....31 Bold square
Hughes, Mr. W. H.....Moss Bank, Newton-by-Chester
Hull, Mr. G. S. N. .....51 Gladstone avenue
Hull, Mrs. ..... ,,
Humberston, Mrs.....11 Pelham crescent, London. S.W.
Humphreys, Mr. E. Noel, F.C.A. Caer-y-Caëë, Hoole
Humphreys, Mrs. ..... ,,
Hunter, Mr. Jas. .....Maisonette, Hough green
Hunter, Mrs. ..... ,,
Hutton, Mr. F. W. .....53 Greenway road, Runcorn
Hyde, Mr. Lees.....Parr's Bank, Ltd.

Illingworth, Mr. F. H.....12 Liverpool road
Illingworth, Mrs..... ,,

Jack, Mr. A. S. ..... Belle Vue, 72 Hough green
Jackson, Miss ..... 52 Hough green
*Jackson, Mr. Randell, M.B., D.Sc., 67 Hoole road
Jackson, Mrs. ..... "
Jackson, Rev. A. E., M.A. ..... The College
James, Mr. J. F. ..... 1 Mount Pleasant, Saltney
James, Miss M. ..... 32 Clare Avenue, Hoole
James, Miss G. ..... "
*Jebb, Mr. G. R., C.E. ..... Fairyfield, Great Barr, Birmingham
Jephcott, Mr. Charles, M.A., M.B., L.R.C.P., M.R.C.S } 12 Upper Northgate street
Jenner, Mr. H. A. ..... 11 White Friars
*Johnson, Mr. M., L.D.S.I. ..... 21 York villas, Lorne street, north
Johnson, Mr. Thomas C. ..... 30 Eastgate row
Johnson, Mrs. Mayo ..... 10 Lorne street
Johnson, Miss R. ..... 52 Bridge street row, west
Johnson, Mr. H. P. ..... Highclere, Brook lane
Johnson, Mrs. ..... " "
Johnson, Mr. J. L., M A (Oxon) .. 30 Brook lane
Jolliffe, Mr. H. D. ..... Kilbroney, Curzon park
Jones, Miss ..... 3 Lorne street
Jones, Mr. John ..... The Spinney, Hunter street
Jones, Miss Gwladys M. ..... Avoca, Garden lane
Jones, Mr. Owen E, J.P. ..... Tynrheol, Amlwch
Jones, Mr. Fred ..... 134 Foregate street
Jones, Miss A. E. ..... Higher Grade School, Hunter street
Jones, Mrs. W. H. ..... Cliveden, Hough Green
Jones, Mrs. Evan ..... Bodrenig, Bala, N. Wales
Jones, Mrs. Wm. ..... 33 Cuppin street
Jones, Mr. Henry ..... 96 Watergate Flags
*Jones, Rev. Richard. B.A. ..... Penybryn, Llandinam, R.S.O., Mont.
Jones, Mr. Charles ..... 50 Princess street
Jones, Mr. Eric Marsden ..... Tilston Rectory, Malpas
Jones, Mr. George ..... 20 George street
Jones, Mr. W. Llewelyn ..... The Oaks, Helsby
Jones, Mr. John, J.P. ..... Coniston, Newton, Chester
Jones, Mr. J. H. Stanley ..... Glenhurst, Hoole road
Jones, Mr. W. A. ..... The Grosvenor Museum
Jones, Mr. E. Peter, J.P. ..... Greenbank, Eaton road
Jones, Mrs. ..... " "
Jones, Mr. Thomas ..... Willow street, Oswestry
Joyce, Rev. Canon G.C., M.A. .. St. Deiniol's Hostel, Hawarden

Kay, Mr. John ..... 3 Northcote Mansions, Hampstead Heath, London, N.W.
Keell, Mr. James A. ..... Manor House, Queen's park
Keell, Miss Muriel ..... " "
Kennedy, Mr. J. B. ..... Dee Banks House
Kenyon, Mrs. ..... Poplar House, Flookersbrook
Killon, Mr. R. W. ..... 59 Tarvin road
Killon, Mrs. ..... "
Kind, Mr. T. S. ..... 15 The Groves
Kind, Mrs. ..... "
Kind, Mr. R. Gordon ..... "
*Kingsley, Miss ..... Keys, Eversley, Winchfield
Knight, Miss ..... 8 Eastgate row
Knowles, Mr. E. R. ..... 15 Grosvenor street
Knowles, Miss ..... "
Kynnersley, Mr. E. M. Sneyd .. Boughton Lodge

Laing, Miss S. C. ..... 2 Mount Pleasant, Saltney
Laing, Miss H. C. ..... St. Michael's School
Lamb, Mr. R., J.P. ..... Nelson House, Hoole road
Lamb, Mr. R, junr. ..... Yrfon. Granville road
Lamb, Mrs. ..... " "
Lamont, Mr. A. ..... Oldfield road, Heswall
Lancaster, Mr. Arthur ..... 14 Weaver street
Latham, Mr. J. S. ..... Green bank, Liverpool road
Latham, Mrs. ..... " "
*Lawrence, Dr. A. ..... The Asylum, Chester
Lawson, Mr. Philip H. ..... St. Eilian, Newton
Laybourne, Mr. J. H. ..... 21 The Groves
Laybourne, Mrs. ..... "
Leah, Mr. W. ..... Strathearn, Hoole road
Leather, Mr. Wm. ..... 40 Lower Bridge street
Leaton, Miss Isabel ..... Glanavon, Boughton
Lees, Mr. W., M.R.C.S. ..... The Bars
Lewis, Rev. J. S., M.A. ..... The Vicarage, Ruabon
Lloyd, Sir Horatio, Knt. ..... 8 Stanley place
Lloyd, Mr. F. Horatio ..... "
*LLoyd, Colonel Wilford N., J.P. .. Eccleston hill, Chester
LLoyd, Mrs. ..... " "
Lloyd, Miss M. E. ..... 13 Chichester street
Lloyd, Miss C. ..... 62 Princess street
Lloyd, Mr. G. ..... 38 Duke street
Lloyd, Mr. W. H. ..... Glenhurst, Hoole road
Lloyd, Miss ..... 24 Castle street
Lockwood, Mrs. ..... Fern House, Queen's park
Lockwood, Miss ..... 6 Spring gardens, Hoole
Loft, Miss ..... Station House, Blacon
*Longbottom, Mr. F.W., F.R.A.S. .. Haslemere, Queen's park
Longbottom, Mrs. ..... " "
Lorimer, Mr. J. A, ..... c/o Mr. A. E. Lovell, M.A., 75 Bouverie street
*Lovell, Mr. A. E., M.A. ..... 75 Bouverie street
Lovell, Mrs. ..... "
*Lowe, Mr. W. F., A.R.S.M., F.I.C., F.C.S. } 18 Hough Green
Lowe, Mrs. ..... "
Lowe, Mr. Jas. F., B.A. ..... 47 Dee banks
*Lucas, Mr. A. W., F.G.S. ..... 4 St. John's road, Queen's park

Macdonald, Mr. G. ..... 3 Abbey square
*Macdonald, Miss Eva, M.A. .... "
*Macdonald, Mr. G. E., L.D.S.E. . 23 Queen's square, Bath
MacGillycuddy, Major, J.P. .... Ballinagroun, Annascaul, R.S.O., Co. Kerry
MacGillycuddy, Mrs. ..... " "
Mackenzie, Miss, B.Sc. ..... 1 Halkyn road, Hoole
Maddocks. Mr. Frank ..... Briar Dene, Percy road
Maddocks, Miss ..... 8 Abbot's Nook, Victoria road
Mann, Dr. A. ..... 18, Newgate street
Mann, Mrs. ..... "
Mann, Miss ..... "
Margerison, Mr. L. ..... Love Street Council School
Marriott, Mr. J. W. ..... The Grosvenor Museum
Marsden, Miss ..... 6 Grosvenor park road
Marston, Mr. F. W. B. ..... School of Art, The Grosvenor Museum
Marston, Mr. Harry ..... 24 Bridge street
Martin, Mr. N. M. ..... Parr's Bank Limited, Chester

Massey, Miss .....10 Baths street
Matheson, Mr. Alex.....20 Castle street
Mathews, Mr. D. H. F. .....Kilmorey park, Hoole
Matthews, Miss .....County Asylum, Chester
Matthews, Mr. A. E. .....5 Parkgate road
*McKerchar, Mr. John .....35 Giesbach road, Upper Holloway, London, N.
McKinlay, Mr. J. .....31 Cheyney road
*McMichael, Mr. J. A., B A., B.Sc...39 Parkgate road
McMichael, Mrs. ..... ,,
Meeson, Mr. W. H. .....16 Eastgate row
Mill, Miss F. .....26 Eaton road
Mill, Miss Frances .....St. Mary's Rectory
Millett, Mrs. G. P. .....Lyndir, Rossett
Millington, Mr. C. .....Shordley Green, Hope, near Mold
Millington, Mrs. ..... ,, ,,
Mills, Mr. Richard .....Cartre, Westminster avenue
*Miln, Mr. G. P. .....Milnholme, Brook Lane
Miln, Mrs. ..... ,, ,,
Miln, Mr. Thos. Edward.....14 Arpley street, Warrington
Milner, Mr. J. A., B.A. (Oxon)..Manor Farm, Barnston, nr. Birkenhead
Minns, Mr. Alfred.....10 Marlborough terrace, Londonderry
Minshull, Mr. C. H. .....5 Lorne street
*Mitchell, Rev. J. C., B.D., F.R.A.S Brenvar avenue, Ardnadam, Argylshire
Moat, Miss F. .....24 Castle street
Modern, Miss E. S. .....75 Boughton
Moore, Mrs. H. .....2 Queen's park
Moreton, Mr. T. W. E., M.R.C.S...Tarvin
Morgan, Mr. R. T. .....2 Newgate street
Morgan, Mrs. Cyril .....25 White friars
*Morris, The Rev. Canon D.D., F.S.A. ..... St. Gabriel's Vicarage, 4 Warwick square London, S.W.
Morris. Miss C. .....Avondale, Halkyn road
Moss, His Honour Judge.....50 Hough green
Moss, Mrs. ..... ,,
Moss, Mr. Wm. Richardson ..The Oaks, Upton, Chester
Mostyn, Sir Pyers W., Bart. ..Talacre, Holywell
Mostyn-Roberts, Mrs. R. .....Bryntirion, Chester
Moulton, Mr. John W. .....24 Lord street, Boughton
Mulvey, Mr. W. E. .....9 Overleigh road
Murray, Miss .....1 Derby place, Hoole
Musgrave, Mr. J. .....45 White friars
Musgrave, Mrs. ..... ,,
Musgrave, Mr. A. J. ..... ,,
Musgrave, Miss ..... ,,
Muspratt, Mr. E. J. .....Within Croft, Dee banks
Muspratt, Miss ..... ,, ,,

New, Mr. Henry .....14 Crane street
New, Mr. Wm. J. ..... ,,
Newbold, Mr. G. H. .....10 Paradise row
Newall, Dr. W. A. .....Bolland's Court House, White friars
Newall, Mrs. ..... ,, ,,
Newman, Mr. J. E. .....1 Sunny bank, Queen's park
Newman, Mrs. ..... ,, ,,
Newstead, Mrs. R. .....Witcombe Villa, Handbridge
*Newstead, Mr. Alfred, F.E.S. ..The Grosvenor Museum
Nicholls, Mr. G. F. .....20 Chichester street
Niven, Miss .....8 Seller street
Nixon, Mr. J. G. .....Selkirk road, Hough green
Norbury, Mr. T. .....Hill Crest, Upton heath
Nutting, Miss F. A.....Gloverstone, Castle street

Ockleston, Mr. W. .....4 Abbot's Hayes, Liverpool road
*Okell, Mr. E. W. .....22 Northgate street
*Okell, Mr. P. H. .....Wisbeach House, Glan Aber park
Orrett, Miss .....West view, Garden lane
Osborne, Mr. Geo. F. .....9 Sumpter pathway, Hoole
Owen, Mr. A. .....1A, Halkyn road, Hoole
Owen, Mr. W. J. ..... ,, ,,
*Owen, Mr. R. Cecil, B.Sc., F.C.S...89 Foregate street
Owens, Mr. John .....5 Grey friars
Owens, Mrs. ..... ,,
Oxenbould, Mrs. .....4 Abbey street

Page, Miss .....c/o Miss Ellis, Mount Pleasant, Saltney
*Parry, Mr. T. S., M.B. .....10 Upper Northgate street
*Parry, Mr. Morys .....37 Victoria road
Parry, Mr. Robert.....Westcote, Hoole road
Parry, Mr. S. Taylor .....4 Princess street
Payne, Miss .....4 Abbey green
Payne, Miss A. .. ..... ,,
Payne, Mr. H. C. .....The Cottage, Eccleston
Pearson, Mr. F. C. .. ..... ..Huke's Library, The Eastgate
Pearson, Mrs..... .....Fircroft, Hough green
Pearson, Miss G. ..... ..... ,, ,,
Polkinghorne, Mr. Chas.....47 Tarvin road
Pollard, Miss .. .....The Queen's School
Posnett, Mr. L. W. ....." Pierremont," 14 Liverpool road
Potter, Mr. William .....18 Vandyke street, Liverpool
*Potts, Mr. A., M.A. .....Diocesan Training College
Potts, Miss L. S. .... ..17 Hough green
Powell, Mrs. T. J. .. .....37 White friars
Powell, Miss .....38 Eastgate row
Powell, Miss A. L. .....The Queen's School
Poyser, Mr. Henry .....34 Nicholas street
Preece, Sir Wm. H., K.C.B., F.R.S...Penrhos, Carnarvon
Preston, Mr. A. C. .....Abbot's Grange, Liverpool road
Prichard, Miss .....9 The Groves
Priddey, Mr. A. B. .....25 Seller street
Pringle, Mr. Wm. .....30 Cambrian crescent
Proud, Miss M. H. .....Ashmount, Tarvin road
Pye, Mr. Fred A. .....Highfield park, Rhyl
Pye, Mrs. ..... ,, ,,

Raby, Mr. E. J. .....13 Vicarage road, Hoole
Randles, Miss H. .....2 Baths street
Read, Mrs. ..... Kenwyn, Dee banks
Redman, Mr. W. R., B.A., B.Sc..Inglewood, Glan Aber park
Reese, Mr. J. E. .....39 Halkyn road
Reynolds, Mr. G. H. .....67 Liverpool road
Ribton, Mrs. .....Cartref, Glan Aber park
Rigby, Miss Honora M. .....2 Abbot's Hayes, Chester
Robb, Mrs. .....37 Northgate street
Roberts, Miss .....Bank Cottage, Neston
Roberts, Miss Johnson.....West Point, 40 King street
Roberts, Mr. B. C., J.P. .....Oakfield, Upton
Roberts, Mrs. .. ..... .... ,, ,,
Roberts, Mr. J. Sheriff, J.P. ....The Gables, Curzon park
Roberts, Mrs. ..... ,, ,,
*Roberts, Mr. John Thos., M.B. ..Montana House, 127 Boughton
*Roberts, Mr. E. Owen.....144 Boughton

Roberts, Mrs. ..... The Nook, Westminster park
Roberts, Mr. Frank E., J.P. .... 3 Sandown terrace
Roberts, Mr. W. Pierce ..... The Shrublands, Hoole
Roberts, Miss Lucy ..... 5 Ermine road, Hoole
Roberts, Miss Gladys ..... "
Roberts, Mrs. Jessie ..... 2 Stanley place
Robertson, Mr. H. R., F.R.M.S. Upton grange
Rogers, Mr. James ..... 22 Black friars
Rogers, Mrs. ..... "
Rogers, Mr. William ..... 104 Watergate flags
Rogers, Mr. C. W. ..... "
Rogers, Miss P. ..... 88 Watergate flags
Rogers, Mr. Arthur Leslie ..... 24 Lorne street
Rogerson, Mr. G. H. ..... Polefield, Liverpool road
Rose, Mr. W. R ..... 23 Bridge street row
Ross-Wallis, Mr, L.D.S. ..... 4 Grosvenor road, Wrexham
Ross-Wallis, Mrs ..... " "
Rowland, Mr. L. B. ..... Whybro House, Wrexham
Royle, Mrs. ..... Hough Green House
Rutherfoord, Dr. H. E. ..... 8 Abbey square

Sadler, Mr. James H. ..... 24 Albion street
Salmon, Miss Maud ..... 39 White friars
Salmon, Mrs. R. R. ..... Holly Bank, Rowton
Savage, Colonel .... ..... 20 Curzon park
Saxton, Mr. F. C. ..... Parr's Bank, Ltd.
Schröder, Mr. W. G., A.R.C.A., 32 Eaton road
*Scouller, Mr. Walter D., B.Sc., F.C.S. 12 Moss bank, Parkgate road
Scott, Mr. John ..... Brook lane
Scott, Rev. Canon S. Cooper, M.A. St. John's Rectory
Scriven, Miss ..... St. Paul's Infants' School
Segar, Mr. F., L.D.S.E. .... White Friars House
Sewell, Mr. F. C. ..... City Walls, The Eastgate
Shand, Miss E. M. ..... Kingston House
Shand, Miss E. F. ..... "
Shaw, Mr. R. G. ..... 6 Bridge street
*Shepheard, Mr. T., F.R.M.S. ..Kingsley, Bournemouth West
Shepheard, Miss ..... " "
Shepheard, Mr. W. F. J., F.C.S. .Bridge street row
Shepheard, Mrs ..... Eversley, Hoole
Shepherd, Rev. F. E. A., M.A. ..20 Brook lane
*Shone, Mr. W., F.G.S. ..... Upton park
Shone, Miss G. ..... "
Shone, Mr. Wm., Junr. ..... "
Shurrock, Mr. F. A. ..... School of Art, The Grosvenor Museum
Shuttleworth, Mrs. A. ..... Waterside Lodge, Barrelwell Hill, Boughton
*Siddall, Mr. J. D. ..... 23 Eaton road
Siddall, Mrs. .. ..... "
Siddall, Miss G. M. ..... "
Siddall, Mr. Charles Kingsley .. "
Siddall, Mr. T. A. ..... "
Siddall, Miss A. M. ..... "
Siddall, Mr. W. W. ..... Percy road
Siddall, Mrs. ..... "
Sill, Mr. T. S. ..... Bridge Colour Co., Ltd., Stalybridge
Simon, Mr. John ..... 4 Eastgate row
Simon, Mrs. ..... "
Simpson, Mr. Ricardo ..... Newton bank
*Simpson, Mr. Frank ..... 10 Grosvenor street

Skelton, Mr. J. M. .....4 Ash grove, Wrexham road
Skelton, Mrs..... ,, ,,
Skipwith, Mr. Francis, J.P.....9 Eversley park
Smith, Miss H. ..... .....3 Abbey green
Smith, Mr. T. .....9 White Friars
Smith, Mr. Emanuel L. .....14 St. Werburgh street
Smith, Mr. T. J. F., F.R.A.S. ..Newstead, Wavertree, nr. Liverpool
Southworth, Mr. Joel .....3 Moss bank, Parkgate road
Sparling, Rev. W., M.A.....Upton Vicarage, Chester
Spencer, Mrs. W. A. .....30 Hough green
Spencer, Miss Annie.....50 Eastgate row
*Spurling, Rev. Canon F. W., M.A..9 King street
*Stendall, Mr. J. A. Sidney .....Municipal Museum, Belfast
Stephen, Mrs Peter .....Crosslooms, Mollington
Stevens, Mr. T. .....14 Eastgate row
Stewart, Mrs. .....13 Stanley place
*Stirling, Mr. James .....5 Dorlcote road, Wandsworth Common, London, S.W.
Stolterfoth, Mrs. .....1 Grey friars
Stolterfoth, Miss ..... ,,
Storr, Mr. F. .....19 The Groves
Storr, Miss ..... ,,
Storrar, Mr. Andrew, J.P. .....Bryntirion, Chichester street
Stowe, Mr. F. W.....The Grosvenor Museum
Sturge, Mr. F. A. .....Coed Efa, Wrexham
Stubbs, Mr. E. .....Bache Hall Gardens
Sumner, Mr. William .....11 Chichester street
Sutton, Mr. D. Carlyle, M.B. ....10 Nicholas street
Sutton, Miss ..... ,,

Tasker, Mr. W. W. .....Moulson House, Hoole road
Tasker, Mrs. ..... ..... ,, ,,
Tatler, Mr. A. A. .....16 Bouverie street
Taylor, Mr. J., F.R.C.S., J.P. ..Haygarth House, 28 Nicholas street
Taylor, Miss ..... ,, ,,
Taylor, Mr. J. R. ..... ,, ,,
Taylor, Dr. J. G., M.A. .....35 Nicholas street
Taylor, Mr. A. G.....6A Woodsome road, Highgate road, London, N.W.
Taylor, Mr. G. Crosland, J.P. ..Ravenscar, Helsby
Taylor, Mr. W. R. .....4 Grosvenor place
Taylor, Miss .....2 Grosvenor place
Teaves, Miss .. .....Langham House, 37 City road
Thomas, Dr. E. J. Haynes .....18 Pepper street
Thomas, Miss..... ,,
Thomas, Miss Constance..... ,,
Thomas, Miss F. M. ..... ,,
Thomas, Mr. Maurice .....41 Halkyn road, Hoole
Thomas, Mr. E. H. .....The Industrial Schools, Boughton
Thomas, Mr. W. C. .....56 Northgate street
Thomas, Mr. H. F. .....1 Victoria pathway, Queen's park
Thomas, Mrs..... ,, ,,
Thomas, Dr. A. E., M.D., B.Sc. Public Health Department, The Town Hall, Finsbury, London, E.C.
*Thompson, Mr. Joseph.....20 South view, Sealand road
Thompson, Mr. Edward P. .....Paulsmoss, Whitchurch, Salop
Thompson, Miss Ethel .....19 Cheyney road
Thompson, Miss .....30 Eaton road
Thomson, Miss I. .....14 Hough green
Thomson, Mr. J. R., J.P. .....Uffington House
Thomson, Mrs. ..... ,,

Thomson, Dr. H. Hyslop .....Medical Officer Liverpool Sanatorium, Kingswood, Frodsham
Thornthwaite, Miss E. M. .....c/o Mrs. Hincks, Watergate street
Thornthwaite, Miss H. L. ..... " "
Thornton, Miss .....Grosvenor (St. John's) Girls' School
Tidswell, Mrs. R. T. .....The Richard Tidswell Memorial Home, Upper Northgate street
Tilston, Miss .....Harlestone, Newton lane
Tobias, Mr. John .....Crypt Chambers, Eastgate row
Townshend, Miss S.....2 Baths street
Townshend, Mr. C. W., J.P. ..The Coppice, Charlton Kings, Cheltenham
Trott, Rev. H. W. .....Manor House, Saighton
*Tupling, Mr. C., B.A. .....Wirral House School, 4 The Bars
Turner, Mr. Edward .....Bridge Cottage, Port Sunlight
Tyson, Miss Alice ..... .....9 Frodsham street

Upton, Mr. Seward Chase .....Bank House, St. Werburgh street

Venables, Mr. W. H. .....100 Faulkner street, Hoole
Vernon, Mr. W., J.P. .....57 Upper Northgate street
Vernon, Mr. Wm. .....Shotwick park, Chester
Vernon, Mr. J. Thorneycroft ....Bryn Gwyn Hall, Caerwys

Wakefield, Mr. Robert .....22 Westminster road, Hoole
*Walker, Mr. A. O., F.L.S., J.P...Ulcombe place, near Maidstone
Walker, Mrs. ..... " "
Walker, Mr. Ernest .....8 Sibell street
Walker, Mr. John Stringer.....2 Abbey green
Walker, Miss Kate .....25 Hoole road
Walker, Mr. C. G. .....11 The Groves
Waller, Rev. A. H., M.A. .....34 Eaton road
Walley, Mrs. .....Lyncroft, Raymond street
Walley, Mr. F. .....6 Abbey square
Walpole, Mr. John E. .....Highbury, Whitby, nr. Chester
Ward, Miss .....Derby House, Hoole road
Ward, Mr. R. P. .....4 Hough green
Ward, Mrs.....
Warmsley, Mr. F. J. ..... Abbot's Holme, 69 Liverpool road
Warmsley, Mrs. ..... " "
Warmsley, Miss .....11 Vicarage road, Hoole
Warmsley, Miss L. ..... " "
Waterfall, Mr. Charles....."Dalmeny," Shavington avenue, Hoole
Watts, Mr. A. H.....Arnold House School
Way, Mr. N. A. E. .....Bradpole, 57 Liverpool road
Weaver, Mr. John .....Fern Cottage, Christleton
*Webster, Mr. G. Watmough F.C.S., F.R.P.S. } Grange road, West Kirby
Webster, Mrs. M. S. .....14 St. John's road, Queen's park
Webster, Miss ..... " "
Wells, Mr. E. .....Eccleston, Chester
Welsby, Mr. Walter.....Bosville, 25 Liverpool road
Welsby, Mrs..... " "
*Welsh, Mr. John, M.R.C.S., L.R.C.P., F.C.S....43 Tarvin road
Welsh, Mr. W. .....34 Tarvin road
West, Mr. F. T. .....Queen's Park Farm, Chester
West, Mr. G. H. .....Calverton, Raymond street
West Miss Eva M. ..... "
Westminster, His Grace The Duke of..Eaton, Chester
Westminster, Her Grace The Duchess of "

Westminster, Her Grace Katharine Duchess of..Combermere Abbey, Whitchurch (Salop)
*Whichello, Mr. H., L.R.C.P., M.R.C.S...The Mount, Tattenhall, Chester
Wigg, Mr. Walter J. .....The Firs, Newton
Wilkinson, Miss M.....51 Granville road
Williams, Mr. John ..... ...Blue Bell bank, Saltney
Williams, Miss Aldersey .....100 Watergate flags
*Williams, Mr. James .....24 Hough green, Chester
Williams, Mr. Vincent, B.A. .... ,, ,,
Williams, Mr. T. A. .....15 Cheyney road
Williams, Mr. W. .....The Croft, Flookersbrook
Williams, Miss Pattie ..... ..Greenfield, Upton heath
Williams, Mr. R. G... .....Crypt Chambers, Eastgate row
Williams, Mr. W. R., M.A ....Rylease, Stocks lane
Williams, Mr. Geo. .....12 Filkin's lane, Tarvin road
Williams, Miss .....4 Alma street, Boughton
Williams, Miss Florence J.....10 Spring Gardens, Flookersbrook
Williams, Dr. Trevor .....31 Nicholas street
Williams, Dr. David Llewelyn, M.D., D.P.H. } Medical Officer of Health, Wrexham
Williams, Mr. W., D.Sc. .....Rhyd Broughton, Wrexham
Williams, Mrs. ..... ,, ,,
Williamson, Mr. A. J., B.A.Cantab...7 Brookside villas, Hoole road
Williamson, Mr. Thomas .....Cuppin street
Wilson, Mr. E. Siddons .....41 City road
Withers, Miss M. P.....2 Watergate square
Withers, Miss C. ..... ,, ,,
Wolfe, Mrs. .....Broomhurst, Newton, Chester
Wolfenden, Miss Marion.....21 Hough green
Wood, Miss .....30 Hough green
Wood, Mr. Stanley, L.R.C.P. (Lon.), M.R.C.S ..... } The Infirmary, Chester
Woodhouse, Mr. H. H., B.A. ..The King's School
Woods, Mrs., Sc.D. .....Cambridge
Wordsworth, Miss A. E.....Victoria (Girls) Council School, Wrexham
Wright, Rev. Harold H., M.A ..Precentory, Abbey street
Wright, Mrs. ..... ,, ,,
Wright, Dr. R. B. .....Folliott House, 55 Northgate street
Wright, Mrs. ..... ,, ,,
*Wynne, Mr. Geo. F. .....Plas Gwyn, Minera, Wrexham
Wynne, Mr. John ..... .....Elm Bank, Rowton, Chester

Yerburgh, Mr. R. A., M.P. ....25 Kensington Gore, London, S.W.
Yerburgh, Mrs. ..... ,, ,,

# LIST OF JUNIOR MEMBERS

*(Under Rule 6)*

Anderson, Percy .....26 Hamilton street, Hoole

Bairstow, Eric John .....Burley, Queen's park
Baker, John .....29 Gladstone avenue
Baker, Miss Ella ..... ,, ,,
Barber, John Lawrence .....4 Kilmorey road
Barber, Miss May ..... ,, ,,
Bate, Roger.....Summerfield, Kilmorey park
Belton, F. W. J.....Craigside, Sandy lane
Bennett, Miss M. Cecil .....Addiscombe, Hough green
Bleckly, Herbert .....Tentry Heys, Queen's park
Brassey, J. E. .....The Limes, Curzon park
Brassey, H. ..... ,, ,,
Bray, A. A.....Dee Ville, Dee banks
Burges, R. O.....Whitford, 11 Panton road, Hoole
Burton, Clifford E.....The Limes, Weaverham, near Northwich

Chalton, Miss Phyllis.....Wynstay, Hoole
Clough, Miss Judith A.....78 Hough green
Collins, Vivian ..... .....c/o "Kings," 14 Eaton road
Cooper, Miss Rosamond G. .....50 Liverpool road
Curlett, Miss Kathleen .....The Mount, Queens park

Day, Miss Gladys .....Bryntirion, Chichester street
Delany, Miss .....7 Lorne street (South)
Dodd John, Junr. .....73 Bouverie street
Drinkwater, Miss Hilda.....Grosvenor Lodge, Wrexham
Ducker, N. .....27 George street
Dutton, Harry Piers .....Freshfield, 27 Curzon park
Dutton, Norman Edgar .....Wellfield, Newton

Edwards, Thomas Wynne.....Brynteg, Hough green (South)
Evans, Alan.....76 Hough green

Fennah, Bertie .....Park House, Grosvenor Park road
Field, Miss Elizabeth Isabel.....31 Gladstone avenue
Foden, E. J.....5 Moss bank, Parkgate road
Foster, Roe.....Roade Villa, Upton park
Frost, Miss Olive .....Mollington Hall

Gibson, Geo. Philip .....99 Faulkner street, Hoole
Gilling, Harold F. .....Cops Lea, Dee banks
Goodman, W. A. Harold .....Laburnum Grange, Boughton

Harker, Gordon .....10 Hough green
Harker, Miss Marjory ..... ,, ,,
Higgins, F. W. .....14 Egerton street
Hodge, Miss Isabel.....7 Hoole park
Holmes, Miss L. Freda .....Ashcroft, Hough green
Holmes, Miss Dorothy ..... ,,
Holmes, Cedric..... ,,
Humphry-Williams, Lionel E. ....St. Mary's mount, Flint
Humphry-Williams, Miss Marjorie ,,

Jacques, T. .....96 Francis street
Jones, Raymond .....Cliveden, Hough green
Jones, C. Brellisford .....Avoca, Garden lane
Jones, Miss Olive .....33 Cuppin street

Kirkland, Arthur.....c/o Mrs. Kenyon, Flookersbrook

Laybourne, John Oscar .....21 The Groves
Laybourne, Miss Florence Ada .. ,,
Lockwood, Arthur W. C.....Clovelly House, 28 Hamilton street
Lorimer, David .....c/o Mr. A. E. Lovell, M.A., 75 Bouverie street
McKinlay, Miss Jeanie .....31 Cheyney road
Mann, Francis Alfred Wharton ..18 Newgate street
Mann, Geoffrey Howard..... ,,
Millett, Humphry .....“Lyndir,” Rossett
Miln, G. Gordon .....Magdalen College, Oxford
Miln, J. Douglas .....Milnholme, Brook lane
Miln, W. Wallace ..... ,,
Miln, Miss Connie ..... ,,
Moore, Leslie .....60 Liverpool road
Moss, Miss Jennie .....50 Hough green

Nayler, J. L. .....4 Derby place, Hoole
Newman, F. C. .....Arnold House School

Paddock, Hubert.....Eton Villa, Cambrian road

Shepheard, G. T. Kingsley .....Eversley, Hoole
Shepheard, Stanley J..... ... ,,
Siddall, Frank .....23 Eaton road
Simon, J. Malcolm .....4 Eastgate row
Skeldon, Norman .....20 West Lorne street
Spencer, John Reginald.....19 West Lorne street
Storrar, James .....Newgate Street House

Tatler, Miss A.....16 Bouverie street
Thornton-Jones, Miss Sylvia ....The Queen’s School
Trott, Miss Mary Catherine .....Manor House, Saighton
Tupling, Miss Gertrude .....Wirral House, 4 The Bars
Turnock, Claude .....20 The Groves

Walley, Miss ..... .....Lyncroft, Raymond street
Wardle, G. E. .....11 Bold square
Weaver, Thos. A. .....Fern Cottage, Christleton
West, Miss Florence L. .....Calverton, Raymond street
Welford, Miss .....5 Eastern pathway, Queen’s park
Williams, Leslie .....26 Hough green
Williams, Miss Hilda ..... ,,
Williams, Miss Daisy ..... ,,
Williams, Miss Marjory .. .....24 Hough Green
Williams, Miss Georgina ..... ,,
Williams, Joseph Lobz .....19 Raymond street
Wolfe, Miss Elsie .....Broomhurst, Newton
Wolfe, Miss Phyllis..... ,,
Wynne, Miss Hilda Mary .....49 Tarvin road

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*** **The Committee invite special attention to the Rule for admission of Junior Members, which is as follows:—**

> **“That Junior Candidates between the ages of twelve and “twenty-one shall be admitted, at a subscription of 2/6 “per annum, to all the privileges of the Society “excepting that of voting.”**

**It is earnestly hoped that those parents who have boys or girls interested in Natural History will allow them to join the Society, under the auspices of this Rule.**

PRESENTED
25 JUL. 1910

CHESTER:
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MDCCCCX.